Address in Medicine:

FRIENDS IN COUNCIL.

Delivered at the Annual Meeting of the British Medical Association held at Cheltenham on July 31st, 1901,

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DR. GOODHART, after the usual complimentary introduction, gave the keynote of his address as follows:

"The position of medicine, then, to-day, as I see it, is this: the living body, the clay between the potter (the doctor's), on the one hand, and the wheel (the blind guidance of animal life), on the other."

He then discoursed upon vitality, the living energy of the body. "Take these two points, the intricacy of the mechanism of the animal body and the indomitable animal spirit of life which innervates it. How do these react upon the practice of medicine and do we acknowledge the reaction as it exists?" From these two points Dr. Goodhart proceeded to discuss "the difficulties of medicine."

PATIENTS.

We must for a moment consider each of the two parties, their influence upon each other and thus upon the progress or otherwise of scientific medicine. Are we gradually surging on by a natural process of evolution to a perfect system of the treatment of disease? Is the management of the sick man and the ailing man in the present day as perfect as it might be? On the larger side of the subject—that of preventive medicine and the scientific knowledge of disease—it is obvious that great discoveries have been made in the recent past, and the dawn is surely breaking of a still more brilliant day. So far as this side is concerned I think it may be said that we are steadily working upwards to that time when much of the present gross disease—tuberculosis, microbic fevers, &c.—shall be no longer; though even here, if there were time, I might pause to show how a weak sentimentalism sometimes steps in to delay the promise of the future; but in the aspect with which we as physicians are concerned, the daily treatment of disease, with all the manifold details of the aches and pains that flesh is said to be heir to, one cannot but feel that there is room for improvement, both on the side of the patient as on that of the practitioner. Now, on looking over the field of disease, although it is said that the average duration of life is longer than it was, I find neither that medicine is less often in request nor that an ailing public is less in evidence. I am here to contend, on the contrary, that we are growing more and more sensitive about our health, more impatient when the flies of ill-health worry us, that we are crying more loudly for a cure for every disease, whether it be one that is commencing and curable or so advanced that—as, say, in a bad case of phthisis—the greater part of an organ is practically destroyed, and a restoration of its health impossible.

This is shown in several ways. In the first place the sick man wants to know too much. He wants to know what is the matter with him when it is not possible to tell him; moreover, he will have an answer, and if not he thinks the doctor an ignoramus, and calls in someone else. How blind he is not to see—it seems so obvious—that in this complex body of ours there must be hundreds of little accommodations between the various organs and parts that it is impossible to explain or be sure about, that there must be numberless reactions that we cannot give a cause to; numberless conditions that will bear several interpretations; numberless others that cannot be labeled at all; numberless states that look grave, and yet if we could only peer a little into the future, get just one glimpse behind the veil, we should see were just on the turn towards health, and no matter what drug was given would do well—the cradle these of many an ignorant man's reputation; and numberless cases that seem to be doing well that are just on the verge of a catastrophe, and these the grave of many a competent man's success. Oh if men would only think a little more, it seems so obvious that they must then see that even the best of us are but gropers in the dark, and that ignorance acknowledged is no proof of want of skill, rather is it a proof of thought and of the highest devotion to the advancement of our calling. Any fool can give a name to a disease if, as is too often the case, the letter satisfieth. But what if the name is wrong, and the name determines an important line of treatment, what if the letter killeth?

It is because the public will have a disease ticketed when there are no means of identification that these difficulties arise, and because it still sets such store by the man who plunges. How much better would it be if the obvious were better recognised, that the practitioner is but mortal, and if others than ourselves could take part intelligently in our doubts and difficulties. And having got a name for his complaint, from either wisdom or ignorance, the patient thinks his physic tumbles out of the same slot, and that between the two he will be cured offhand. Someone comes into your room and says "I have got to do this or that on a particular date and you must get me well by that time." It is the medical man or his medicine that has got to do it; there is no thought behind, as there should be, of "Will my tissues or the disease allow of this being done?" There is no idea of doubt, none of the necessity of waiting to see which way the cat jumps, none that the powers of medicine are limited in all sorts of ways and that there are numbers and numbers of instances where there is no indication whatever that medicine will do any good whatever: that waiting for developments or subsidencies is the only skilful course. Waiting is described as "nothing is being done for me," and someone else is called in with a "Can't you do something?" "Doctor, I'm just stuck," said a poor fellow to me the other day when all hope had left us, though keeping him radiant still.

And it is because life understands so little the common sense of this waiting, this doing nothing, this length of illness, and so on, that it understands so little the true value of consultations. The sick man or his friend has a rooted idea that when a second opinion is sought it is to set the first opinion right. Now the wise man is he who makes fewest—there is no man who never makes any—mistakes, and least of all in medicine. Our uncertainties are so thickly strewed on all sides that it is seldom that one is in a position to give a very positive opinion; but I think I may say, with an approach to certainty, that I am in accord with those who are in a similar position to myself, that the education of every member of the medical profession at the present day is so high, that it is seldom indeed that a consultation does not produce a well-thought-out and probable diagnosis from the practitioner in charge. It is not a case of right or wrong; it is not altogether a question of less or more experience: it is a meeting to discuss doubtful and difficult points to which each party contributes an equal share. But so little is this the light in which consultations are regarded that it has become a saying that "doctors in consultation always agree; doctors apart will always differ." I am constantly being annoyed, in all innocence, by being told that "I want a perfectly independent opinion," as if that were the last thing the applicant considered himself likely to get. An independent opinion too often means an opinion more in accord with the wishes of the patient than is the one which has been originally given. Medical men would be only too glad to discuss the doubtful points of a case with the patient or his friends, if those could be found who could appreciate them intelligently; but it is hardly to be expected that differences of opinion should be made much of when the sick man is unable to appraise them at their true value and puts trivial and important matters equally into the same scales of right and wrong, and when wrong always implies with them discredit. And discredit may come from the most worthless sources. For instance, one man may have ordered hot water for drinking, and No. 2 says, "Drink cold water." It does not matter a mote in the sunbeam which of the two is drunk, but the symptoms change within a measurable distance of the alteration, and the undiscerning man puts it all down to "the new treatment." A change in the medicine is made, say more to ease the patient's mind than with any real expectation of influencing the course of the disease; and while

one man reaps the credit the other has the blame, and each alike may be entirely innocent of the result. Then this morbid sensitiveness of people in the present day is well shown by the rapidity with which they fly to medicine. This fact is, I think, patent enough—it is to the practitioner, at any rate—for the number of new drugs for all sorts of maladies, imaginary and real, that are being daily launched upon us is bewildering in the extreme. A woman with migraine has gone the round of all the coal-tar products that were ever invented, as well as caffeine and other things, before she thinks of applying to our calling. Most people know all about lithia and piperazine and the respective merits of the various preparations of Carlsbad salts; they all have their own form of blue pill, which generally from the look of the prescription seems to date from before the flood. They have their own special dinner pill and an aperient pill as well; they know all about podophyllin, and euonymin, and cascara. They take their bismuth and soda for indigestion, mindererus spirit and Dover's powder for colds, camphor for cholera, chlorodyne for the stomach-ache; and one old gentleman that I have known, though he had been bred amongst medical men and was old enough to know better, was so enamoured of drugs that he took a daily dose of gentian and ammonia as his lunch.

Then, too, with what impatience do men and women in the present day rush into the not always sufficiently repellent arms of surgery. A little pain unnerves them and all they know of surgery is its successful side. It is a day of great things, and why should they not have the benefit of these advances? And so with an ache here or a pain there they undergo an operation. The energy of life that I have so often spoken of knows nothing of risks, knows nothing of shock, will hear nothing of waiting and rest in bed, and the disappointment in consequence is often considerable, although the operation was a great success.

DOCTORS.

And now for the potter who has more or less to fashion this clay as it somewhat impulsively rolls along under the momentum of the wheel of life. The simile is not a good one, for the practitioner is never a fashioner, although sometimes in the plenitude of his pride he conceives himself to be and then o'erleaps himself, not he, but his patient, unfortunately, falling on the other side.

What are we doing in this impatient, restless age to stem the tide, to stay the panic, to bid the people keep its head? I do not mean in the immediate present—for we always do our best for the patient according to our lights—but with our eye on the future and that continuous progress as individuals for which the Goddess of Medicine is marking time, and surely points us to. I do not doubt, I say, that everyone of us does his best for the man who consults him, but I am not sure that in attending to the exigencies of the immediate present we do sufficiently take heed of the future. And our failings in this respect are closely bound up with those of our patients, for we in our place are so anxious to overlook nothing and to cure disease, so enthusiastic in our belief in our power to accomplish what we wish. First may be put a morbid readiness on our part to detect disease. Engaged as we are in this pursuit there comes a risk that we too little appreciate the wide range of health—that is, how good a state of health is compatible with numberless slight and even sometimes considerable departures from normal. We tend to make our standard too severe for practical purposes. I will take an illustration from the heart. Here is an organ in which there are numberless slight departures from a rigid normal, both as regards its muscular action and functions, which mean nothing as regards the longevity of the patient, but to which a morbidly tender medical conscience refuses the title of health. Over and over again in the present day a heart is said to be strained, or weak, or dilated, or even diseased as to its valves from a want of sound appreciation of what is to be considered health, not for the general, but for the particular. One would almost think from all the talk one hears about dilatation of the heart, strains in healthy young people from trivial causes, the grave conclusions that are based upon, perhaps, some slight displacement of the impulse, &c., that the heart is so fragile an organ that it needs to be coddled from the cradle to the grave. It is the fountain of life certainly and therefore a very indispensable organ, but Nature gives to our comely as to our uncomely parts a strength sufficient for their day, and there is a large margin for emergencies in every part. It is for this reason that I hate the term "weak heart." It coffins, or, worse, throws useless upon society, many an otherwise useful life. Hearts are either diseased or healthy and, within its margin, it is a robust organ that is all the better for plenty of work. I tell you what it does not like and that is luxurious ease and one may well have a shrewd suspicion that many a one who coddles a weak heart dies of real disease which an indolent habit has produced.

Let me take another organ popular at the present day both with the medical man and his patient, and upon which both parties have, I fear, gone a trifle adrift. It shall be the stomach. Catarrh of the stomach is a term that is in most people's mouths, and it is a word that appears to have a strange satisfaction in the utterance. Catarrh is quite a sufficient disease, wherever it may be, to silence the anxious inquirer and no more questions are asked. But, as I have said before, the stomach does not catarrh—at any rate readily. It is a good, strong, healthy servant, with possibly a prejudice or two, and if you treat it fairly is really, quite unlike most servants of the present day, most obliging and thorough. And even if upon occasion you do not treat it with quite that sensitive regard that it is entitled to expect, you may hurt its feelings, as any want of consideration is likely to do to a faithful handmaid who has done her best; yet it is only a momentary estrangement, a little domestic concern that wants no third party such as rhubarb, or creasote, or salol may be, to rub the injustice in. A little carbonic acid to soothe its ruffled feelings and a kindly sorrow and repentance on the part of the master, with a penitential fast, and things will soon come right.

And while on stomachs I hear a good deal of a so-called dilatation of the stomach. Now a true dilatation of this organ is a comparatively rare thing, and when it occurs it often needs, and is benefited by, rather heroic measures. But the great part of these so-called dilatations are due to a passive relaxation of our inward parts, and this is due to the bankrupt condition of our abdominal brains. These and quite a number of other abdominal displacements are so common without any symptoms of any kind, that it is certain the condition is only a disease under special circumstances, and those special circumstances have more to do with the individual than with his displacement, and their best treatment is to let them severely alone. But the public won't have it. Who does not know the difficulty there is in preventing people from undergoing a serious operation for the purpose of stitching these harmless mobilities—for it is only quite exceptional that it is otherwise—into their places. It is the same in many another region—throats and noses suffer terribly from this lust of operation that has beset the public. Ears are now being swept into the panic, and I incline to think that the only region of our art that preserves its proper decorum is that of ophthalmic surgery, and it, I believe, reaps the reward of well-doing that is usual in this topsy-turvy world in being regarded by the *élite* as somewhat old-fashioned, and so it is supposed to be the thing to go abroad to skim the cream of skill.

But let me quit the domain of medical surgery to take up the question of our administration of drugs. It is told, as many of you know, of the late Sir William Gull that upon a medical man excusing himself for not having discovered the existence of a particular disease he remarked that it was as well that he had not done so, for that if he had he might have treated it.

DRUGS.

Now, why do we give drugs? To cure disease, you answer at once, and think the question unnecessary. But wait a minute; we give drugs for several other reasons, some of which are far less free from criticism. For example, drugs are often given, not because the disease demands one, but because the patient is not happy till he gets it: too often he is not happy even then. They are given sometimes to hide our ignorance, I fear, or to mark time while we watch and wait; they are given sometimes as a gambler on the Stock Exchange speculates in "futures," an enhanced reputation being the windfall that it is hoped to secure; and then we often give drugs as an experiment in the hope that they may do good. I will deal with this last more especially, for it is a reason for giving drugs about which the public are peculiarly sensitive and ill-informed. It is often said as a matter of prejudice against the hospitals of our country—than which none could possibly be conducted more humanely and considerately—that the patients are made the subjects of experiment. So they are. But this happens not only in

the hospital. If it be true—and it is true—that you and I are unique in our way, and that it is this individualism of man that constitutes the great barrier of the evolution of any system of medication, it follows that each new patient who demands treatment is more or less a case for experiment, and it is by experiment of this qualified kind—upon the king as he sits upon his throne, as for the poorest being within his realm—not only that the value of drugs is established and new powers gained over disease, but by which an increase of knowledge of disease itself is gained. The cure of disease is always the fundamental object; but not far behind it should come the alert eye to watch the deviations from the hypothetic normal which the individual resistance or the drug in its action may show in the course of the case.

All treatment by drugs is more or less of an experiment, and it is, indeed, in this fact that the enormous number of new drugs daily poured upon us finds its justification. Many and many an ailment that afflicts mankind badly needs a remedy, but for which, as yet, no remedy is opportune; and who knows but what in each new drug some human ill may find alleviation? A druggist's shop is indeed a source of wonder and dismay to me, and I could indeed wish we were less the prey of the manufacturing chemist, but I would not for a moment even seem to discountenance new remedies. What I would discountenance is the giving of drugs by rule of thumb. Diseases run in fashions; I have mentioned one or two that seem to me in fashion now, and there are fashionable drugs which, while the sun shines upon them, become the darlings of society. Their popularity is enormous—far in excess of their merits; and by-and-by they sink into the cold shade of neglect. Who does not even now remember the boom of the antipyretics? A few of them have remained to us for other purposes; but as antipyretics who gives them now? They are not by any means valueless when given appropriately, but they were rushed for more than they were worth, and they are now buried by later booms, such as animal extracts and antitoxins, and many of these will be buried too. And then as to routine in the treatment of disease. I suppose there is not a single case of gout in the whole world that has not had sodium salicylate and other easily enumerated drugs, and had them freely; and why?—because they are supposed to eliminate the cause of the disease. I find that the British public know far more about uric acid and how to deal with it than I do with all my pains, and what men think they know in this respect, I fear that we, in the first place, and vulgar advertisement in the second place, have taught them. Yet I cannot understand how any reflective mind, making a careful study of gout in its clinical aspect, can settle down and bury itself in the doctrine that gout is a mere question of intake and output, and, if not, think of the harm that is done by false doctrine of this kind upon the thousands who are engaged in the hopeless struggle of dispossessing themselves of their fetish.

The open-air treatment of consumption, of which we are hearing much at the present day, is also bidding fair to come under the baneful influence of routine. "The new treatment," though it is hardly a compliment to our environment to call it so. What, think you, does the sufferer from consumption, and his friend, see in this? He sees a residence for a few months in a home, and a cure at the end of it. Is that what he has any chance of obtaining? Certainly not, and in proportion to the exaggerated hope will come the bitterness of the disappointment to the sick and the discredit to us. The benefit to be obtained in these sanatoria is that there will be learned a habit of life—what we mean by plenty of good food and plenty of fresh air; and having learned his lesson the tuberculous man will need to practise it all the rest of his life. There is no cure in this treatment as the sick man understands cure; for although it is true that there is no disease that is more often arrested than phthisis, it is equally true that there is no disease that has a more inveterate tendency to relapse, and I very much fear that when you come to strike the balance between arrest and relapse the latter has the best of it. Therefore if the open-air treatment is to take its real place and be of any abiding value the principles of the sanatorium must be introduced into the home.

And that reminds me of another fashionable idea that is now in vogue, and I will call it medical antisepsis. Antiseptics in lung disease have had a long day, tempered only by a momentary fall into heresy when it was proposed by those who ought to have known better that we should be converted into gasometers for the storage of sulphuretted hydrogen—and this was to cure consumption. I only mention this to show how much we need to keep our imaginations in check in thinking over the cure of disease. However, antiseptics in the lung from all the many inhalations up to iodoform, and finally creosote internally, have had a good innings and have not been without their minor successes, but it was very meet and right that the comparative inefficacy of such nauseous medicaments should drive us back into the arms of the great original antiseptic—fresh air. And perhaps for that reason we have now turned a somewhat cold shoulder to the lung and are directing our efforts to rendering the intestinal canal antiseptic and I hear daily of creasote and salol and all sorts of other well-meaning drugs being sent on this errand of reform. Far be it from me to decry the value of useful remedies, but I cannot help asking myself the question whether the staunch believers in intestinal antisepsis possess sufficiently cultured and liberal-minded noses to be good advisers to our intestinal apparatus. It is quite evident that stercorin, however much so to us, is not a *persona ingrata* to our colic mucous membrane; it is, indeed, bone of its bone; and it is possible that we might be none the healthier men and women even if our medical men got their wishes in this respect.

One other drug only will I wish to mention to illustrate my point, and that shall be the use of the bromides in epilepsy. Now, that these are useful drugs in this complaint no one will question to-day. But long ago it has gone forth from those who are in authority in such matters that after a person has suffered from epileptic fits the drug must be given regularly in considerable doses, and for long periods of time—a year or two, or more—to prevent their recurrence; and this advice is very generally acted upon. There is no doubt that it has become the routine treatment of epilepsy and as such I think it often does a great deal of harm; and I am by no means certain that it does any equivalent good.

THE DANGERS OF ROUTINE AND FASHION.

Now all this routine and fashion—and remember I have only taken one or two instances out of numbers that lie at my hand—I object to, and I do so because it all tends to establish false relationships between the medical man and his patient, and let me attempt to show you how. The patient first of all asks us for a name to his disease and whether we know or not we give him one. In so doing we, as I say, speculate in "futures," and that is a form of business that very often ends in bankruptcy. No remark is more frequent at a consultation than that we must give a name to the disease. I object to giving a name to anything I am not sure about and when a man says to me, "That is all very well for you, but it would never do for me," I object still more because the general practitioner is the great instructor of the public in matters medical. I have not a tithe of the influence that he has, and by giving names to symptoms that are doubtful in their significance, he is first of all losing an opportunity of insisting upon the dignity of ignorance; then he is conveying to the public the erroneous notion that we have the power of insight into problems that are at the time inscrutable; and we ultimately end in deceiving ourselves into thinking that we know much more than we do—an idea that is fatal to the progress of knowledge. There are hundreds of examples that might be given, but the various febrile disorders are the most fertile in discords of this sort. It is often absolutely impossible in the early days of typhoid fever to say what is the matter; equally is it absolutely impossible in many of the eruptive fevers to say what of several things will eventually declare itself. It is not ignorance but knowledge that halts. When I first entered Guy's Hospital some 36 years ago it was a common saying about one of our staff at that time—and certainly one of the best physicians of that day—that he knew so much that he could but seldom be prevailed upon to give a positive diagnosis. And it is true, as Sir Arthur Helps says in the book from which I have borrowed the title of this address, that knowledge brings doubts and exceptions and limitations that are all hindrances to vigorous statement.

Then a word about the evil of letting the public force our hand in the matter of drug-taking. I have already alluded to routine as destructive of all scientific observation, enabling as it does the giver to see only cures and nothing of failures, though they be in very truth staring him in the face. But I am now alluding especially to the numberless occasions when drugs are given, there being at the time no distinct indication for giving anything. There is no doubt that this is

a very common and bad fault with us. I do not say that it must never be practised. There are times when the sick are not reasonable beings, and unless they have a bottle of medicine to anchor their faith to (oh, shifting sands!) they are in a state of unrest that is positively harmful to their progress. But there are multitudes who are not in this parlous state who are capable of listening to reason, but who as now, having been taught to look for their prescription or their bottle of medicine, have no idea of the value of advice only or of the need of the watchful eye. Why, we are all familiar with the "Are not you going to give me a prescription?" when you have been pouring in advice with much prodigality of tongue and had flattered yourself that you had gained a disciple; and there is no need to go far to be absolutely sure that the great body of the public, rich and poor, pay for our prescription, and that they do not value by a button any advice that lies outside it.

But I think that there is another reason for this indifference to the value of advice which, although it is perhaps one that savours of the sordid, I must nevertheless touch upon. I have often inwardly contrasted the two professions of law and medicine, how in the one advice pure and simple is sought and found and the givers thereof acquire positions of milk and honey and find themselves mounting to the high places of the land. In the other medicine passes for the consideration, and, well! the sellers thereof do not seem to possess themselves of many coveted places of honour. And if you ask me why this is I believe it to be because we make ourselves too cheap. Advice—just think of it! A product of so unique a value that when a man of great experience in the world of medicine dies his knowledge dies with him; no other man can supply his place and there is a dead loss to the community of a mine of unrealised information. You all know that very clever signboard in which a bullock is seen gazing yearningly upon a small jar of meat extract and exclaiming, "Alas! my poor brother." But I often wish that I could pot my brothers as they flit from off the stage; my trouble is that my masters die unbottled. And yet we "give" advice, and there are those in number who not only accept but ask the gift. Oh, dreadful degradation—that advice, a priceless article, should fall in value below cheese and butter.

It is told of the late Sir Andrew Clark, with what truth I do not know, that when he was asked to give gratuitous advice he said, "No; but I will give you the money with which you can purchase it." Whoever said this was a wise man, for on the one hand there was in the answer the generosity that knows no bounds of medicine to poverty; there was on the other the dignity and self-respect that fully understood the preciousness of the knowledge that he had the power to impart. We shall never make the public understand the true position of medicine until we set a higher value upon *ourselves* and upon the *advice* we give.

What better illustration could there be of the inutility of thus giving ourselves away than that so shrewd and penetrating and fair-minded a man as Mr. Joseph Chamberlain, in so grave a matter of right and wrong as the question of cheap consultation, should have declared that the question was settled by medicine upon the strictest trade union principles; and that another man, equally hard-headed if erratic, should agree upon that point, and then proceed to define trade unionism as "doing the worst possible work at the highest possible price." Cheap consultations! Philanthropy has, indeed, there got hold of the wrong end of the stick. Why, it is notorious that such is the generosity of medicine that there is not a needy person in the whole kingdom who cannot, if he need it, obtain the best opinion in the country gratuitously. The clergy, the army, the navy, artists, actors, actresses, clerks, artisans, and others pour into a practitioner's room or the hospital asking alms in the shape of advice and never get a refusal. And after it all we are insulted by being called trade unionists—"men who do the worst possible work at the highest possible price." And I honestly believe we have ourselves to thank for this in great measure, for we belittle the value of our advice in allowing the public to exalt so greatly the supremacy of physic.

That "the labourer is worthy of his hire" is but one side of the question, and not the best side, for it might be held to cover many a sordid act: the other and much the more important is surely this, "See to it that the hire is worthy of the labourer." And although expressed in these terms the face value may seem to be one of low ideals, I am far from thinking, as I speak, of any money consideration, but of the higher and nobler recompense of dignity and self-respect. And it is, in part, because I think that to careful observation it must seem that the very nobleness and generosity of medicine does tend somewhat to make us forget the importance to its well-being of these just rewards that I have chosen this subject for my address to-night.

On, then, my comrades, in your noble work till other voices, other years, shall bid you pause in other ways, according to their seeming. Mark well the hindrances to our onward progress that together we have traced to-night, be more than ever heretofore the steersman at the helm, to guide the sometimes teasy ship between the troubling eddies of the passing thought, and then your greater selves, firm anchored in "the spirit of the years to come," need reck not

> "Lest the cause ye love
> Should languish when your tender toil-worn hands
> Are crossed in peace beneath the daisied sod:
> The Means wax old and perishable prove,
> The End endures eternally, and stands
> Above the ages, face to face with God."

Address in Surgery:

SOME SURGICAL LESSONS FROM THE CAMPAIGN IN SOUTH AFRICA.

Delivered at the Annual Meeting of the British Medical Association at Cheltenham on August 1st, 1901,

BY SIR WILLIAM THOMSON, C.B., M.D. R.U.I., F.R.C.S. IREL.,

HONORARY SURGEON TO HIS MAJESTY THE KING IN IRELAND; SURGEON TO HIS EXCELLENCY THE LORD LIEUTENANT, K.G., AND TO THE RICHMOND HOSPITAL, DUBLIN.

SIR WILLIAM THOMSON commenced by making a feeling reference to the late Sir William Stokes who laid down his life in South Africa. He then passed to consider the entirely novel conditions under which the war in South Africa was fought. He gave some figures illustrative of the effects of rifle fire. In the American Civil War the killed were 17·97 per cent. of those hit. In the Spanish-American war, when the Mauser rifle was in use by Spain, the American killed were 11·9 per cent. of those hit. The latest figures from South Africa show that 14·8 per cent. of our men who were hit died. Small-bore bullets, continued Sir William Thomson, made ghastly wounds if they ricocheted and he quoted an unmistakeable instance of this that had come under his own eyes:

A soldier accidentally discharged his rifle at a distance of 10 paces. The bullet ricocheted and struck the victim on the inside of the thigh posteriorly to the femoral vessels. The entrance was more than an inch in diameter, the exit at the outer side was a wound two and a half inches in diameter, with great loss of substance. Here there was no doubt as to the weapon or the ammunition employed. The soft structures alone were injured, but they presented the appearance that one would expect as the result of some powerful local explosive.

WOUNDS OF THE SOFT PARTS.

The campaign in South Africa has presented many surprises. Perhaps none is greater than the large proportion of wounded who have recovered. Even severe wounds have responded to treatment in a manner which has surprised everyone having experience of surgical injuries. These happy results were due in the first place to the character of the bullet. The wound was in ordinary cases exceedingly small at both apertures, and the tendency was to close immediately. There was usually little hæmorrhage and the openings were quickly sealed by exudation. This was an important first step. The pointed end of the bullet made the area of primary collision with the surface struck quite minute, and being covered in a hard mantle it acted like a steel wedge driven with great velocity through the soft parts, rather cleaving than tearing its passage onwards. It appeared to contuse the walls of the channel sufficiently to prevent considerable oozing and not to lacerate or destroy.

One of my patients, a man of the 11th Hussars, was shot transversely through the cartilages of the nose. The mere margins of the alæ alone remained to keep the outline of the perforations unbroken. If the bullet exercised a destructive force appreciably beyond the channel which it made the edges of the alæ must have died, so thin were they; but they never showed any tendency to necrose, and the wounds were healed in three days.

But even in long flesh wounds in the exremities the same rapidity of repair was noticed. Here again the character of the injury influenced the result, for the walls of the track did not remain rigid, leaving a permeable tunnel. As soon as the passage had been accomplished the walls fell together, and thus further helped in the exclusion of air and in lessening the risks of sepsis.

Various suggestions have been made but have not been sustained that asepsis has been secured by the heat generated in the bullet itself—heat which it has been claimed is sufficient to destroy any pathogenic organisms. Cartridges carried in bandoliers were always exposed to contamination, but I have no doubt that the bullet received a thorough cleansing in the rifle. It was, of course, slightly larger than the bore and was forced to take the turn of the rifling by the explosion. The result was a certain polishing of the outer surface under immense pressure, and the after sources of contamination could only be found in passage through the air, the man's clothes, and his skin. Practically penetration was effected by a piece of clean very hard metal. Of course, there is no doubt that germs did gain access even under such circumstances, but in how many cases, even in operations under elaborate precautions, are they entirely absent? Unless the conditions which make them potent exist they give no trouble. The second cause was the early application of the first dressing. This was not always done by the surgeon. Very frequently the wounded man was able to attend to his own wants in this particular. Sometimes dressings had been lost and a piece of old linen or window-blind did duty. In spite of these, however, and of skin ingrained with dirt, the early closing of the apertures helped to avert mischief. But in the case of the extremities the bandages were of special importance in fixing the track of the wounds, in securing apposition of the walls, and in keeping the parts in that immobile condition which was of so much importance. The third cause was the climate. The temperature was high, the atmosphere very dry and particularly free from germs hostile to the surgeon's work. The general elevation of the plains in the northern part of Cape Colony, through Orange River Colony, and on to the Transvaal varied from 4000 to 6000 feet, higher by nearly 2000 feet than any mountain in the United Kingdom. The conditions, therefore, were exceedingly favourable. The intensely dry atmosphere quickly transformed oozing blood into crusts, and so helped on the healing in a wonderful way. In a moister climate the results probably would not have been as good, and we should have had to deal with a greatly increased number of cases of suppuration.

WOUNDS OF BONES.

So far we have been considering the effect of the small-bore bullet upon soft parts. Let me pass on to discuss the damage done to bones and the rate of mortality which followed. The subject is important, because in this as in all wars injuries of the upper and lower extremities outnumber many times those of any other part of the body. I will take a convenient illustration—the American Civil War. The total number of wounded treated in the Northern hospitals was 245,800; 71,594 were wounds of parts excluding the extremities; wounds of the upper extremities were 87,793; of the lower 86,413. These produced fractures of bones in 32,992 and 27,274 respectively, or a total of 60,266. Injuries of bones, then, hold the first place in number, and hitherto they have been followed by an appalling mortality. It is in the damage inflicted upon these structures that we find the strongest evidence of the power of the small bore. As the improvement in the rifle developed there was also an alteration in the shape of the bullet, which became elongated, and during these changes the character of the injuries to bones became correspondingly severe. The velocity at which the modern bullet travels as it leaves the muzzle may be taken as about 2000 feet a second, but during the flight this rate is gradually reduced owing to well-recognised causes. It is obvious that if the bullet within a few hundred yards after it has been fired strikes a bone it does so with crushing force, and that the severity of the injury decreases just in proportion to the distance which intervenes between the rifle and the object struck. In other words, the greater the velocity the greater the destruction when the bullet is suddenly obstructed by striking the shaft of a bone. Without entering into a discussion of the so-called explosive force produced on impact, what we find is that the bone is much comminuted and that fragments are carried some distance onwards in the soft parts as the bullet travels. But as the velocity lessens the effects are not so destructive; the bone is broken, sometimes into a few pieces, at the point at which it is struck, and sometimes the fracture has no subsidiary fragments. Occasionally a case is met with in which the velocity has been just enough to break the bone but not to carry the bullet through the limb after the collision. The behaviour of the bullet in the cancellous structure of the ends of bones differed from what I have just described. In the older forms of conical bullets with low velocity there was much tendency to lodge in these structures, but in this campaign the injury was chiefly a complete perforation. The different structure of the ends of bones as compared with the shafts accounted for this. The cancellous tissue presented a more or less elastic obstacle and yielded to the impact; but in the case of the shaft the hardness of the parts struck offered considerable resistance, and much of the force of impact was expended in breaking the denser obstruction into minute pieces.

AMPUTATIONS THROUGH THE THIGH.

In the campaigns of 40 or 50 years ago few injuries were more fatal than gunshot fractures of the femur, and the doctrine which had been laid down by earlier writers that amputation should be immediately performed still largely influenced practice. The flesh wounds were much more severe. Principles of cleanliness had not yet been formulated; the wounds always suppurated, and the result was a compound and comminuted fracture which often developed the worst forms of sepsis. It was to avoid these almost inevitable results that amputation was advised, for it got rid of a lacerated wound and fragments of bone and gave for a time a hope of safety. Nevertheless the mortality was appalling. Here are a few figures:—

Results of Amputation of the Thigh in Gunshot Fractures.

—	Cases.	Recovered.	Died.	Percentage of mortality.
Crimean war	2748	227	2033	73·5
American war (North) ...	6229	2839	3310	53·8
Franco-German war (German)	798	243	514	65·6
Franco-German war (French)	3794	342	3452	90·9

Out of a further group of 9017 cases 83 per cent. died.

But the results of conservative treatment did not show to much more advantage in the Crimea and the United States. I give the figures in the same campaigns by way of strict comparison.

Results of Conservative Treatment in Gunshot Fractures of the Thigh.

—	Cases.	Recovered.	Died.	Percentage of mortality.
Crimean war	555	153	402	72·4
American war (North) ...	3467	1689	1684*	49·9
Franco-German war (German)	811	530	253	28·7
Franco-German war (French)	896	811	85	9·4

* Result unknown in 94 cases.

Nevertheless there was an improvement. The historians of the American Civil War hailed as victory the return which showed a mortality of 49·9 per cent. in conservative practice as compared with 53·8 for amputation. It was a gain of nearly 4 per cent. for the treatment which aimed at saving the limb.

Then came the Franco-German war nearly 10 years later, and the lessons from America bore fruit. There was still a large number of surgeons whose opinion was valued who believed in immediate amputation, but even these yielded to the force of experience, and conservation as against amputation won by a difference of 26·9 per cent. The experience of France was remarkable, as only 85, or 9·4 per cent., are reported to have died without amputation, but the number given is so small that I am not prepared to accept it as representing the surgery of the period. Still the lesson remains that in those campaigns when the revolt against amputation began the result was with the progressives.

But if we turn to the recent Cuban war we have a further gratifying experience. Surgeon-General Sternberg reports that during the two years 1898-99 "82 cases of gunshot fracture of the femur were reported, six of which were treated by primary amputation and two by resection, the remaining 74 cases being treated by conservative methods, not because the conditions were not favourable for the performance of primary operations, but because of a conviction that under present methods of treatment the limb could be preserved without materially adding to the danger of life. The limb was lost through surgical intervention in only 7·3 per cent. of the cases. Of fracture of the upper third there were 32 cases, of which five were fatal under conservative methods; of the middle third, 27 cases and three deaths; of the lower third, 23 cases and one death. A general mortality of 10·8 per cent." This is a splendid record of the treatment of compound fractures of the femur in the field. I am not able to lay before you like figures from the campaign in South Africa. They have not yet been completely analysed, and partial results are apt to leave false impressions. Nevertheless, I think I may say that in no way have the number of amputations been so few, the number of limbs saved so many, or the mortality from such operations so small. Amputation of limbs was quite the exception and was only done when the case was otherwise beyond hope. For the lessons of modern surgery the vast possibilities of recovery which the teaching of Lister had put within the grasp of every practitioner of the art in the world had already proved that the nearer we could approach to natural conditions the greater was the safety for the patients. Therefore, when a bone was broken by a bullet and there was no other lesion but the track made through unimportant soft parts the indication was to apply an antiseptic dressing at once to secure as much immobility as possible and to have the patient sent to a place where rest and more deliberate attention could be had.

EXAMINATION OF WOUNDS.

The treatment of these cases in the first stage has led to some difference of views among surgeons, but I am satisfied that reason and experience point in one direction only. It has been recommended that fragments of bone which have been detached from the shaft ought to be removed and the limb then secured in splints. I am strongly of opinion that local examination ought not to be carried out unless the surgeon should be driven to it by developments. The fact that bone is broken can be elicited quite easily by the methods which we employ in a simple fracture. Of what value in treament on the field is it to learn whether there are four or 40 fragments? What should we learn by passing in probes or fingers except that there was fracture and that there were many pieces? To do this we should enlarge the wound considerably, introduce things that probably were not aseptic, disturb adhesions that were already in progress, break down clots, and generally do the things which were the very worst for the patient. It is surprising what little trouble many fragments apparently separated from sources of vitality may give. If they do necrose later they can be dealt with under safe conditions. But I am quite sure that, with rare exceptions, the wrong thing to do on the battle-field in a recent wound by a bullet involving fracture of a bone is to explore it with probes or to enlarge it for the passage of a finger and the removal of fragments.

WOUNDS OF JOINTS.

One of the interesting features of the surgery of the campaign was the injury done to joints. In a majority of cases the bone was more or less injured, but in three out of five cases of perforation of the knee-joint under my own care there was no apparent involvement of bone. Such cases did very well, most of them pursued an aseptic course, and recovered with good movement. Even suppuration did not demand more severe measures than incision and drainage. I have seen a bullet traverse the two malleoli and the astragalus with perfect movement remaining. In the case of a naval officer the head of a pompom entered the astragalus and practically destroyed it, all that remained being the dense walls. There was a fracture of the tibia as well and the limb would certainly have been amputated under the old rules, but I succeeded in saving the foot, although with a stiff joint, and the patient is still in the service. Excisions, again, were rare, and amputations were only performed on the field when vital parts were involved, or there was terrible destruction by a shell, which was an event of infrequent occurrence.

I have specially referred to injuries of the knee-joint because I wish to indicate how satisfactory our experience of them has been in this campaign as compared with that of 40 years ago. Then the doctrine was that when ever the knee-joint was penetrated by a bullet, whether the bone was fractured or not, the limb should be amputated, and the sooner the better. This view existed not only before the American war, but was emphasised by the experience then acquired. In the Crimea out of 138 cases 45 patients recovered and 93 died, or 67·3 per cent. In all but three of these there was fracture, of which the recoveries were 43 and the deaths 92. In the American war there were 793 cases, of which 402 were those of recovery and 376 were fatalities, or 48 per cent. In 659 instances there was fracture, of which 309 were recoveries and 350 fatalities. The proportion of cases in which bone was involved in wounds of the knee in the present campaign will perhaps be found to be somewhat less. But there can be no doubt that in spite of such a serious complication the cases did extremely well. The excisions must have been very few for I did not see or hear of any. The simple perforations were attended by some blood effusion and, in my experience, trivial synovitis, and in these cases treatment by carefully occluding the openings and keeping the limb at rest was generally sufficient to secure safety and early restoration of normal movement.

PENETRATING WOUNDS OF THE ABDOMEN.

But the problem which most exercised the minds of surgeons in South Africa was the treatment of penetrating wounds of the abdomen. These had always been marked by the highest mortality in war. In the Crimea 92·5 per cent. of the British so injured died; 91·3 per cent. of the French. Here was a field in which there was plenty of scope for improvement. In the interval between that great campaign and the present far-reaching changes had taken place in the practice of surgery. It had been shown in civil practice that it was possible to deal with almost all kinds of pathological conditions within the abdomen. In our own country the surgery of this region had reached such a high level of security that many believed that the successes of the civil hospitals could be extended to the field of war, and that at all events the mortality would be diminished very effectively. The late Marion Sims had strenuously pleaded that these cases ought to be submitted to operation, because therein lay greater hope for the patient, and there were few surgeons who went to South Africa who did not hold the same view. In a few months, however, they abandoned that position, after experience of the actualities of war and the almost uniformly fatal results which followed—if they did not depend upon—interference. I think the causes of this were not far to seek. In civil life a patient so wounded is quickly brought into the best position for operation with all the appliances at hand which are almost essential to success. In warfare a wounded man may occasionally reach the field hospital within a short time, but when the casualties count into hundreds and thousands delay may extend into 12, and in some cases 24, hours before he is even rescued. Now, if there is an injury which should be treated promptly it is a lesion of the intestine; but the conditions in which operation should be done, if there is to be hope of success, are not to be found in a field hospital. The equipment is not sufficient or efficient and water is usually bad—in South Africa it was loaded with earth from which no filters could free it; it could not be boiled in sufficient quantity, and what we understand as the toilet of the abdomen was out of the question. There were, as I have hinted, two periods in which the surgical attitude towards these cases was quite different. In the early days many abdomens were opened, but probably all the recoveries after operation were less than a score. This

depressing result has corroborated the experiences of surgeons elsewhere. In the Tirah campaign five cases of laparotomy were reported, but the patients all died. In the late Cuban war Senn says that in the four operation cases of which he personally knew the patients all died. Surgeon-General Sternberg, of the United States Army, reports officially that in the two years 1898–99 they had 116 perforating wounds of the abdomen, of which 81, or 70 per cent., were fatal, and that of 10 cases in which laparotomy was performed nine patients died. In South Africa I have known of a series of nine cases with one recovery. Dr. J. E. Neale, civil surgeon, has, however, reported[1] a case of a man wounded at Frere; 15 inches of the intestine were resected and the patient never had a bad symptom.

But, as I have said, while the whole experience of operations was almost uniformly disappointing even in the most skilled hands, it was observed that many men with wounds of the abdomen did not present any alarming symptoms at all and that many of them quickly recovered. Mr. Watson Cheyne gives his impression, derived at Cape Town, that only 20 per cent. of the abdominal cases had ended fatally; but this, of course, did not account for that large number killed outright or for those who lingered for a few days and died before they could be transferred to the base. We are not yet in a position to deal with exact figures because they are not procurable, but I think it will be found that the proportion of deaths was far in excess of this; indeed, Mr. Cheyne's subsequent experience at the front induced him to regard the death-rate as much higher. He reports 27 cases, of which 18 were fatal, two after operation; Mr. Cheatle 10 cases, of which nine were fatal. From the Philippine war Dr. Robinson has published figures which show 45 cases with a mortality of 48·9 per cent. But of these eight were killed or died within 24 hours. The interesting fact brought out, however, is that of 30 cases which were not operated upon only 10 were fatal, showing in this group a mortality of but 33·3 per cent. These cases include all kinds of internal injuries, many of them necessarily mortal from hæmorrhage, as in wounds of large vessels. But if we limit our inquiry to wounds of the intestines we are still met by serious difficulties in settling the question of operation. Apart from the initial one of the unsuitable surroundings of the field hospital and the insecurity which must attend opening of the abdomen there, we must first try to determine whether the bowel has been wounded at all. If we accept the evidence of the apertures of entrance or exit there generally appears to be no doubt that the bullet has passed direct between the two points, and it seems impossible that the bowel has escaped perforation. But there is abundant evidence, both recent and remote, that bullets and even sharp weapons have traversed the abdomen, not only without fatal results, but without symptoms of perforation of the intestine. I shall not trouble you with any other instances than that given by Mr. Cheatle, and reported by Mr. G. H. Makins in his admirable book on "Surgical Experiences of the War." There the bullet passed through the cæcum and the sigmoid flexure, but the intervening small intestine presented no indication of the slightest injury. Even upon this one case it may be affirmed that a bullet can traverse the abdomen without wounding the intestine. I have seen or treated many cases in which the track of the bullet made it almost a certainty that it had passed through the bowel, and in which the patient presented absolutely no symptoms up to his discharge from hospital. Now here we have another problem. Are we justified in opening the abdomen in such a case as soon as we see it, with no other evidence than two external openings and a belief that the bowel cannot have escaped? There can be no doubt, I think, that after a prolonged search for wounds in the intestine which did not exist the patient's chances of recovery would be much on the wrong side.

But I go further and take the cases in which there is actually a wound of the intestine. Is it possible for recovery to take place? I am quite satisfied that in very many instances of this injury from the Mauser or Lee-Metford bullet the patients survived. Some of them had bloody stools and other symptoms which made plain the nature of the lesion. Many reasons have been given for these remarkable escapes. Probably they have depended in the first place on the angle of the impact of the bullet. A more or less direct hit would make a very small opening, which was immediately closed into a slit by contraction, and in some degree blocked by mucous membrane. The openings may have been further secured by pressure against an adjacent intestine, as suggested by Sir Frederick Treves, and kept secure until finally healed. But if we go back to Mr. Cheatle's case we find that there was no extravasation from the cæcum and no inflammation about the aperture, which had shaped itself into a minute slit. If, however, the bullet struck at a smaller angle it would probably make multiple oval openings, with such loss of substance as to lead to extravasation and rapid infection of the peritoneum. I have tried to show that there are cases in which there is no perforation, although we may suspect it, and cases in which wounds occur which may run a safe course and in which operation would only lead to greater risks. There remains the group in which the wound does allow of extravasation and in which from various signs and symptoms we are able to recognise the condition. These cases as they stand are almost, but not quite, certain to prove fatal. Can we do anything to diminish this tendency? I revert to the difficulty of operating upon them in a field hospital, and yet to send them back to a stationary hospital is almost hopeless. They ought to be operated upon at once, but they are sent away with an infected peritoneum, which becomes worse each hour. What chance is there for successful interference at the journey's end, when the patient is exhausted by pain and exposure and has been jolted in an ox-wagon for a couple of days? Yet if operation is to be done quickly there must be some better equipment of field hospitals and more suitable preparations for this special work, for it is tedious and exacting and it demands expert hands and sound knowledge. But every foresight will be nullified by the pressure of a severe engagement where there are many men to be attended to. When everyone is working at high pressure night and day there is no time for the prolonged operations on the abdomen, unless it is possible to set apart one surgeon to deal with such cases only.

On the whole, then, considering the difficulty of diagnosis in many instances at the outset, the fact that intestines may be found unwounded, and if wounded may be occluded by natural processes if not interfered with, it seems to me that in war as we stand at present the man whose abdomen is perforated by a small-bore bullet has a better chance of life without operation than with it, bearing in mind the circumstances under which laparotomy must be performed on the field. That is an opinion which I think most surgeons came to when experience had ripened after the early months of the campaign. Although the judgment may be a little humiliating it is one which must for the present be accepted

LODGED BULLETS.

The war has developed once again the discussion upon the removal of bullets. Formerly, with the low velocity the proportion of lodged bullets was much larger than it is now. Some surgeons are of opinion that the missile ought to be searched for and removed at as early a moment as possible. I think the practice in ordinary circumstances unjustifiable. If the nature of the wound enables us to reach the bullet without trouble, or if it has lodged under the skin and can be reached by a simple incision, it may be removed. But remembering the character of the wounds made by the Mauser in most cases, enlarging the apertures, or a search with probes or other instruments, may mean a suppurating instead of a non-suppurating track. It has been said in justification that the bullet may become displaced and give rise to troublesome after-effects. If these should occur the cause can then be dealt with, but a bullet may lie buried with impunity throughout a long life. Therefore, except under special circumstances which are sufficiently obvious, nothing should be done beyond trying to occlude the wound and to secure it from contamination.

PROGRESS MADE BY MILITARY SURGERY.

I should have liked to speak of several other forms of injury, all of them full of interest, and of the great advantage given by the use of the x-ray apparatus, but the limits of time demand that I should confine my remarks to some salient facts only. The war is still in progress and it will take a considerable time after its conclusion before we can make an effective summing up. But even thus far we have materials for conclusions which are not likely to be much modified. We have seen a marvellous proportion of recoveries from severe wounds, and we have been able to rejoice at the great reduction of suppurating cases and the practical absence of such

[1] Brit. Med. Jour., vol. i., 1900, p. 604.

infective diseases as tetanus, erysipelas, pyæmia, and hospital gangrene. This great difference in the records of to-day as compared with those of older and more bloody wars does not depend mainly upon the alteration in the bullet used. That, as we have seen, can do fearful things to a dense obstacle and add to its power for mischief by the laceration caused by bony fragments which it scatters on impact. To some extent the smallness of the canal made by it helps towards recovery. But, above all, the results are due to the treatment of the wounds by the surgeon and the operation of those great principles which have developed under the splendid genius of Lord Lister. He has made possible the unquestionable triumph of conservative treatment. Honoured as he is throughout the whole world, proud as we all are to claim him as a compatriot, his most enduring memorial will be in the multitudes whom he has been the means of saving from pain and death, and in the direction which he has given to scientific surgery for all time.

When the recoveries from wounds in this war are made up and analysed it will be seen what a tremendous progress has been made in protecting the injured from disaster, even in the face of all the difficulties of the battlefield. For, while in the general and stationary hospitals the precautions necessary in modern surgery can be observed, it is, after all, at the initial stage that safety from sepsis is to be secured. "The fate of the wounded rests in the hands of the one who applies the first dressing," wrote Von Nussbaum, and the truth of this assertion has been proved every day. War is at all times full of horrors, but as it is waged to-day it is less terrible than before. In the recent Spanish-American conflict the mortality among the wounded dropped from the 12·96 per cent. of the Civil war to 6·64—a reduction of nearly one-half—a result in part no doubt due to the smaller bullet employed, but more certainly to the improved methods which have been established in the practice of surgery.

Our profession has taken its full share in the work in South Africa, and whether as officers of the Royal Army Medical Corps or as civil surgeons all have worked ceaselessly in ministering to the sick and wounded. They have not flinched in danger on the field and they have vied with their combatant fellows in deeds of valour. Six medical officers have been killed, nine have died from disease, and 12 have been wounded; three civil surgeons have been killed, 11 have died from disease, and five have been wounded. Of all branches, including orderlies and nurses, nearly 400 medical helpers have fallen victims to their labours. It is a noble record of devotion. We must always glory in it, but so also must we delight to know that the true spirit of patriotism is still with us and that so many of our profession have been ready to show, by rendering up their lives, that "A country's a thing men should die for at need."

An Address
ON
TUBERCLE BACILLI IN COWS' MILK AS A POSSIBLE SOURCE OF TUBERCULOUS DISEASE IN MAN.

Delivered at the Fourth General Meeting of the British Congress on Tuberculosis on July 25th,

BY PROFESSOR JOHN McFADYEAN, M.B. EDIN., M.R.C.V.S.

MR. PRESIDENT, LADIES, AND GENTLEMEN,—As recently as a few days ago, when I was mentally arranging the material for the paper which I have now the great honour of submitting to this Congress, I was under the impression that it would not be necessary to formally prove that the term "tuberculosis" as it is now employed by medical men and veterinary surgeons relates to one and the same disease. I thought that I might ask my audience to accept it as proved and generally admitted that tuberculosis in man is caused by a single definite species of organism—the tubercle bacillus; that this organism is also the cause of the disease to which veterinary surgeons apply the term "tuberculosis" in the case of cattle and other domesticated species; and that therefore there existed a *primâ-facie* case against the germs formed in the bodies of tuberculous animals as a possible source of tuberculous disease in human beings. To-day, however, the position of anyone who undertakes to discuss the intercommunicability of human and bovine tuberculosis is very different from what it would have been a week ago, for in the interval the greatest living authority on tuberculosis—the world-renowned discoverer of the tubercle bacillus and the man to whom we are mainly indebted for our knowledge of the cause of tuberculosis—has declared his conviction that human and bovine tuberculosis are practically two distinct diseases. I do not know how far the reasons assigned by Professor Koch for the opinion which he now holds on this question may have commended themselves to the members of this Congress, and I am overwhelmed at finding myself in a position which compels me to offer some criticism on the pronouncement of one "the latchet of whose shoes I am not worthy to unloose."

That bovine and human tuberculosis were identical diseases was generally supposed to have been finally determined by Professor Koch himself when he discovered that the human and the bovine lesions contained bacilli that were identical in morphological, tinctorial, and cultural characters, and showed that the artificial cultures from both sources produced indistinguishable effects when they were employed to infect a variety of animals. The labours of hundreds of workers during the succeeding 18 years produced nothing in serious conflict with the conclusion that human and bovine tuberculosis were identical diseases, but they brought to light what appeared to be additional evidence of this identity, such as the discovery that tuberculin produced a specific reaction in tuberculous cattle, whether human or bovine bacilli had been employed in its preparation. In short, the identity of the bacilli from the two sources appeared to be as firmly established as any other generally accepted opinion regarding the identity or non-identity of bacteria associated with disease in more than one species of animal. Since it thus appeared to be proved that the only difference between human and bovine tubercle bacilli lay in their accidentally different position—one being parasitic in man and the other in cattle—it was natural to conclude that when circumstances were favourable for the transference of bacilli from one species to the other human tuberculosis might have an animal origin, and *vice versâ*.

Opinions varied as to the frequency with which this transmission of tuberculosis from one species to the other occurred, but practically never within the last 18 years regarding the possibility and probability of such reciprocal infection. What are the grounds upon which we are asked to discard convictions that appeared to rest on such a solid basis? I shall endeavour to state them briefly, as I understand Professor Koch's train of reasoning. 1. The bacilli found in cases of bovine tuberculosis are much more virulent for cattle and other domestic quadrupeds than the bacilli found in cases of human tuberculosis. 2. This difference is so marked and so constant that it may be relied upon as a means of distinguishing the bacilli of bovine tuberculosis from those of the human disease, even assuming that the former may occasionally be found as a cause of disease in man. 3. If bovine bacilli are capable of causing disease in man there are abundant opportunities for the transference of the bacilli from the one species to the other, and cases of primary intestinal tuberculosis from the consumption of tuberculous milk ought to be of common occurrence. But post-mortem examination of human beings proves that cases of primary intestinal tuberculosis are extremely rare in man, and therefore it must be concluded that the human subject is immune against infection with the bovine bacilli, or is so slightly susceptible that it is not necessary to take any steps to counteract the risk of infection in this way.

Now, with the utmost diffidence I venture to submit that at least one of the premisses contained in this argument is not well founded, that the others have little or no bearing on the question, and that there still remain reasonable grounds for regarding tuberculous cow's milk as distinctly dangerous to human beings.

It cannot be denied that what may be called bovine tubercle bacilli are as a rule distinctly more virulent for cattle and other domesticated animals than are human bacilli or that the results of experiments indicate that in natural circumstances there is little danger of cattle becoming infected from human beings. But it cannot be admitted that the low virulence of human bacilli for cattle proves, or even makes it probable, that bovine bacilli have only a feeble pathogenic power for

man. That might have been held to be probable if it had been shown that bovine bacilli were very virulent only for cattle, but since it is well established that these bacilli are highly dangerous for such diverse species as the rabbit, horse, dog, pig, and sheep, and, in short, for almost every quadruped on which they have been tried, it appears to be highly probable that they are dangerous to man. At any rate, it is impossible to cite any ascertained fact relating to other bacterial diseases that makes the contrary conclusion probable. It is well known that the majority of the disease-exciting bacteria are harmful to only one or two species, but all those that are common to all the domesticated animals are also pathogenic to man.

With regard to the view that the difference between human and bovine bacilli in respect of virulence for cattle is of such a fixed and constant character that it may be relied upon to distinguish the one from the other it need only be said that that is very far from being proved. It appears to be quite possible that what may be called the normal or average virulence of bovine bacilli for cattle may be reduced by passage through the human subject. Besides there are very great differences in the virulence of tubercle bacilli found in animals of the same species and if a low degree of virulence for cattle is to be taken as the distinguishing feature of human bacilli there will be no difficulty in proving that the human disease is sometimes transmitted to the lower animals.

The third proposition in Professor Koch's argument is the only one which is really germane to the point at issue—viz., that only cases of primary intestinal tuberculosis can possibly have had their origin in infected milk or meat and that "such cases are extremely rare." Professor Koch refers to several large series of post-mortem observations that appear to justify this statement and adds that he could have cited many more pointing to the same conclusion. Now, if it were a fact that all the statistics relating to this point were unanimous it would have to be admitted that primary intestinal tuberculosis is rare in the human subject, and that cases of infection through milk are still rarer, though even then it might be advisable to take measures to prevent the few cases. But the statistics are not by any means unanimous, and those that are likely to appeal with most force to the people in this country are not at all in accord with those quoted from Germany. During the last few years the evidence obtainable from the post-mortem records of two of the largest hospitals for children in this country have been analysed with great care in order to see what evidence they afforded as to the relative frequency of the different methods of infection in tuberculosis. In the case of the Hospital for Sick Children in Great Ormond-street this has been done by Dr. G. F. Still and in the case of the Royal Hospital for Sick Children in Edinburgh by Dr. T. Shennan. The conclusion at which Dr. Still arrived was that in 29·1 per cent. of the cases of tuberculosis in children primary infection appeared to have taken place through the intestine. That is very far from being an insignificant proportion, and it is a striking fact that Dr. Shennan arrived at an almost identical conclusion and estimated that 28·1 per cent. of the cases of tuberculosis among children in Edinburgh were due to alimentary infection. There does not appear to be any ground for supposing that there is a large margin of error in these statistics, as the number of cases dealt with was considerable (547 in the two series), and in both series the post-mortem appearances were interpreted in a way to which no exception can be taken. In face of these statistics it is not possible to assent to the statement that cases of primary tuberculosis of the alimentary canal are extremely rare. Precisely the contrary conclusion is the one that must in the meanwhile be drawn with regard to the state of affairs in this country—viz., that, at least in children, primary infection by way of the alimentary canal is comparatively common. I therefore submit that there is still a strong *prima facie* case against animal tuberculosis as a possible source of human tuberculosis, and it becomes necessary to consider whether there are any data from which one may estimate the extent of the danger to which human beings are exposed through the occurrence of tubercle bacilli in milk.

The evidence in favour of the view that the ingestion of tuberculous milk is one of the causes of human tuberculosis includes a number of recorded cases in which the relationship of cause and effect appeared to be obvious. From the nature of the circumstances evidence of this kind is very scanty, and it must be admitted that very few of the alleged examples are absolutely convincing. Tuberculosis is a disease that develops slowly and, assuming for the moment that tubercle bacilli do occur in milk and are a cause of disease in persons consuming such milk, it is obvious that, as a rule, the very act by which the infection is brought about destroys the only direct evidence of cause and effect that exists. One could only expect to be able to trace the disease to the milk when, after the onset of symptoms pointing to infection by way of the mouth, the cow from which the milk had been obtained was still available for examination. In practice this is rarely the case, and it is therefore not surprising that medical literature contains very few specific instances of the infection of human beings with tuberculosis by means of milk. It is obvious, however, that the entire absence of evidence of this kind would in no way exonerate milk from the suspicion of being one of the causes of human tuberculosis.

We have already seen that, at least in this country, in a considerable number of cases of tuberculosis occurring in early life, the first seeds of the disease appear to have entered into the body by way of the mouth. What proportion of these cases ought to be ascribed to tubercle-infected milk? It scarcely appears to be possible to give a very confident reply to this question, though some distinguished authorities have not hesitated to express the opinion that practically all the cases of primary intestinal tuberculosis occurring in childhood may be set down to this cause. The late Sir Richard Thorne, in the Harben Lectures on the Administrative Control of Tuberculosis which he delivered in 1898, expressed his conviction that tuberculous milk was the main cause of tabes mesenterica in children, and he characterised the loss of child life from this cause as appalling. The evidence on which this formidable charge was laid against the milch cow was of the following nature. The Registrar-General's returns show that during the last 50 years there has been a marked decline in the death-rate from human phthisis, which is the form that tuberculosis generally takes when the bacilli are inhaled. On the other hand, during the same period there has been only a slight decline in the death-rate at all ages from that form of tuberculosis which is ascribable to alimentary infection, and among children under one year of age there has been a notable increase in the mortality from that form of the disease. The decline in the death-rate from phthisis is ascribable to the great improvements which have been effected during the last 50 years in the hygiene of human habitations, such as improvements in lighting, drainage, and ventilation. These, naturally, have not interfered with infection through milk, which has therefore remained unchecked and in infants has even increased, because during the last 50 years cows' milk has entered more largely into the dietary of very young children.

There are several weak points in this argument. Perhaps the weakest of all is the assumption that the deaths certified under the head of "tabes mesenterica" correspond closely with those which the pathologist would classify as cases of primary alimentary infection. It is scarcely possible to doubt that the term "tabes mesenterica" in the Registrar-General's return covers a heterogeneous collection of cases of which the majority may not be cases of tuberculosis at all. But even if it is agreed to accept all the cases registered under the head of "tabes mesenterica" as instances of primary alimentary infection, the figures found in the Registrar-General's returns do not support the contention that milk is responsible for all the cases of tabes. It is true that they indicate an increase in the death-rate from alimentary tuberculosis among children under 12 months old, but, on the other hand, there appears to have been a considerable decline in the death-rate from the same cause at all ages between one and five years. Now, if tuberculous milk were a frequent cause of tuberculosis, one would not have expected the death-rate from that cause to decline among children between one and five years of age, for there is no reason to suppose that there has been any decline in the use of cows' milk in the feeding of children at that age during the last 50 years. The fact appears to be that the Registrar-General's returns do not afford much trustworthy information with regard to the number of cases of primary alimentary tuberculosis and are absolutely worthless as an indication of the extent to which human beings are infected by means of milk.

There is another direction in which one may turn for evidence on this point. We cannot with any pretence to accuracy ascertain the number of persons who annually become infected by milk, but we may be able to form some

estimate of the existing danger in this connexion by collecting information as to the frequency with which milk contains tubercle bacilli. We know that about 30 per cent. of all the cows giving milk in this country are tuberculous in some degree. This statement, no doubt, indicates a deplorable state of affairs, but in the present connexion it is not quite so alarming as it at first sight appears. Fortunately, not every cow that is tuberculous gives milk containing tubercle bacilli. It is true that opinions with regard to this point are not absolutely unanimous, but there is ample evidence to justify the assertion that, as a rule, the milk is not dangerous until the udder itself becomes diseased. The experiments pointing to an opposite conclusion form only a small minority, and the results obtained in most of them were probably due to carelessness on the part of the experimenter. In a few of the cases in which the milk of an apparently healthy udder was found to be infective it is probable that the gland tissue was in reality diseased, though not to an extent discoverable without microscopic examination. The important question, therefore, is not what proportion of milch cows are tuberculous, but what proportion of them have tuberculous udders. Some authorities have estimated this to be as high as 10 per cent., but the proportion is certainly much less than that in Great Britain. My own experience leads me to think that about 2 per cent. of the cows in the milking herds in this country are thus affected. Now, the milk secreted by a tuberculous udder always contains tubercle bacilli, and it sometimes contains enormous numbers of them, and when these facts are apprehended one begins to realise the seriousness of the danger to which, in the present state of affairs, those who drink uncooked milk are exposed. But there are one or two considerations that make the danger greater than the mere statement of the number of cows affected would at first sight indicate. In the first place, the udder disease is not attended by any pain or tenderness in milking, and the milk for a considerable time after the udder has become manifestly diseased may appear quite wholesome, though in reality it is charged with the germs of tuberculosis. It therefore often happens that the gravity of the condition is not realised by the milker or the owner of the cow, and the milk continues to be sold for human consumption. There is scarcely any room for doubt that if it were sold and consumed unmixed with other milk some of the persons partaking of it would become infected. In practice it is usually mixed with the milk from other cows that have healthy udders and thus the germs are distributed among a larger number of persons. Even tuberculous milk that has been thus much diluted may prove infective, but the danger to the individual consumer is in inverse proportion to the degree of dilution. Since about one cow in 50 is the subject of tuberculosis of the udder, and the average number of cows in the milking herds of this country is less than 50, it follows that the majority of dairies and farms supply milk that is free from tubercle bacilli, or at least does not contain any derived from this source. On the other hand, when the infected material is present, it operates with the greatest intensity in the milk of single cows and in the mixed milk from small herds

It must be added that tuberculous disease of the udder is not the only source of tubercle bacilli found in milk. A great deal of the milk in the market contains a considerable quantity of dust and dirt, most of which comes from the cow's udder and the hands of the milker, and part from the dust of the air of the cowshed. When 30 per cent. of the cows in a byre are tuberculous the dirt in that building and the atmosphere in it are almost certain to contain tubercle bacilli, and some of these are very likely to find their way into the milk. The more dirt milk contains the greater is the chance that tubercle bacilli from that source may be present.

What has been said with regard to the extent of the danger to which the public are exposed through the sale of milk containing tubercle bacilli may be summed up as follows. The danger cannot be defined by stating how many persons are thus infected annually, or what fraction the persons thus infected form of the total number who contract tuberculosis in the course of a year. At the same time, it is impossible to doubt that the danger is a very real one, since at the present time milk is a vehicle by which tubercle bacilli are often introduced into the bodies of human beings.

As to the means of averting the danger, the ideal method of counteracting this source of human disease would be to stamp out bovine tuberculosis or to prevent the sale of milk from every cow that is tuberculous. Unfortunately, it must be admitted that at present that is unattainable. At the present time probably not less than 30 per cent. of all the breeding and milking cattle in this country are in some degree affected with tuberculosis, and to urge that the disease should be attacked on the lines adopted in dealing with cattle-plague and pleuro-pneumonia is an effectual method of preventing any Government from touching the subject. But although the complete and rapid extermination of the disease is impossible it does not follow that nothing can be done, or ought to be done, in the way of prevention. The disease has attained to its present alarming proportions simply because, until quite recently, altogether erroneous notions were held regarding its cause, and because there has hitherto been the most absolute neglect of the precautions necessary for its prevention. The greatest obstacle to successful action against tuberculosis, whether in man or animals, is the ignorance of the laity regarding the cause of the disease. The immense majority of cattle-owners are not yet convinced that contagion is the only cause of tuberculosis, and very few of them have yet made the slightest effort to check the spread of the disease. As a rule, cows and other cattle visibly ill from tuberculosis are still left alive and in close association with their fellows, although the lowest grade of common sense and prudence would suggest that such animals ought to be promptly killed or at least isolated. It is not want of common sense, nor is it mainly lack of means, that is responsible for this reaction—it is simply a want of conviction on the part of cattle-owners that tuberculous animals are dangerous to their companions.

The first thing necessary in this connexion is education of the people regarding the nature of the disease. This is necessary, because in this country, where Parliament never moves except by the force of public opinion, the legislative action required will not be taken unless the people are satisfied of its wisdom and also because even the most drastic sanitary measures enforced by the law are likely to fail if they are not supplemented by the intelligent coöperation of the people. The National Association for the Prevention of Consumption and other Forms of Tuberculosis and the Royal Agricultural Society have been endeavouring to disseminate sound views regarding the cause of bovine tuberculosis among farmers and others, but much remains to be done in this direction. But it is not reasonable to ask that things should be left as they are until the education of the farmer in the matter of tuberculosis has been finished. If there are any practicable and reasonable measures by which, figuratively speaking, the flow of tubercle bacilli from tuberculous cows to healthy human beings can be stopped or impeded, they ought to be immediately enforced.

As soon as the valuable diagnostic properties of tuberculin had been proved by experience it occurred to a good many people that its assistance ought to be called in in order to exclude tuberculous cows from milking herds. In other words, it was thought that although it might not be practicable to insist upon the application of the tuberculin test to all infected herds and to compel the isolation or slaughter of all cattle thus found to be infected, it might still be possible to require that only cows found to be free from the disease by the application of the test should be kept for milch purposes. I doubt whether anyone who is well acquainted with the circumstances of the case now believes this to be practicable. Here, again, the fact that one-third of the cows now giving milk are tuberculous is an insurmountable obstacle. The cost of carrying out the tuberculin test several times annually in all the milking herds in this country would be enormous, and the exclusion of all reacting cows from such herds would seriously disorganise cattle-breeding as well as milk production. Moreover, to rely blindly on the tuberculin test, and to pronounce the milk of every cow that does not react to it free from tubercle bacilli, would be very unsafe. The test is recognised to be one of great value, but it is not infallible. Rather serious defects in connexion with it are: (1) that for a period after infection—a period that is sometimes very considerable—an animal will not react; (2) that in some advanced cases of tuberculosis no distinct reaction is obtainable; and (3) that in a considerable proportion of cases a second reaction is not obtainable for some days or weeks after the first. It is therefore clear that if we wish to exclude the milk of tuberculous cows, or if the object is the more restricted one of preventing the sale of milk from tuberculous udders, some system of inspection is necessary.

This was the conclusion at which the second Royal Commission on Tuberculosis arrived. We have already seen that whatever danger attaches to milk comes mainly from cows with tuberculosis of the udder, and the public health would be almost entirely safeguarded from this danger if we could exclude such animals from our dairies. Periodical examination by competent inspectors would go a long way towards securing this object, but the inspection would require to be at rather short intervals, for tuberculosis of the udder may come into existence and attain most dangerous dimensions in a period of a few weeks. The more frequent the inspection the better, but of course this means a great deal of expense. If every town and rural district produced its own milk it would be a comparatively simple problem to organise and carry out a fairly efficient system of inspection of milch cows, but as the law at present stands the majority of the population cannot obtain this safeguard. With the exception of Glasgow, Manchester, and a few other places, a local authority has no power to inspect cows outside its own district, and the helpless position in which this state of the law leaves the inhabitants of London and other large towns is obvious. If cows of which the milk is sold for human food had everywhere to be submitted to periodical inspection such inspection would naturally be undertaken by the various local authorities, each of which would supervise the cows and cowsheds in its own district; but the compulsory inspection of all the milch cows in the country would be a very large undertaking, and perhaps it would be premature to press for it. In the meantime a good case can be made out for making general the special powers relating to inspection of cows in outside districts which a few fortunate cities have acquired by special Acts of Parliament. This also was one of the directions in which the members of the second Royal Commission on Tuberculosis considered immediate action to be necessary.

There remain for consideration some other safeguards which would doubtless be less effective than those just discussed, but which, unlike these, would not be difficult to enforce—viz.: (1) compulsory notification of udder disease and of any symptoms of tuberculosis in milch cows, with, of course, the power to inflict a considerable fine for not reporting; and (2) the interdiction of the sale of milk from any cow suffering from tuberculous disease of the udder or exhibiting clinical signs of tuberculosis. Against the demand for the amendment of the existing law to the extent of granting the public these very reasonable safeguards against infection through milk it cannot be urged that they would be very expensive or that they would press harshly on private interests. The present state of the law, or rather the almost entire absence of any law, dealing with tuberculous disease of the udder in cows is a scandal and a reproach to civilisation. It scarcely sounds credible, but it is a fact, that the owner of a cow in the most advanced state of tuberculosis, and exhibiting the most manifest signs of udder disease, may sell that cow's milk for human food as long as the sale has not been specially interdicted on the certificate of a veterinary surgeon, and that no penalty attaches to this crime of deliberately or carelessly placing on the market a food material charged with the germs of a dangerous disease. In the interests of public health the sale of milk from tuberculous udders and from cows that are obviously tuberculous in any part of the body must be stopped, and it must be declared illegal to keep such animals alive. There need be no hesitation in pressing for this reform because the measures demanded are in the interests of the owners of cattle and would be advisable even if it were established that bovine tuberculosis is not transmissible to man. There is no dispute as to the danger of visibly tuberculous animals to others of their own species, and it is the very reverse of a hardship to the owner of such animals to insist on their being slaughtered.

It would probably be regarded as a serious omission if I did not refer to one other method of counteracting whatever danger at present attaches to impure milk as a cause of tuberculosis. No matter how highly charged milk may be with tubercle bacilli, it can be deprived of all danger from that source by raising it to the temperature known to be fatal to these germs. Less than the boiling temperature (212° F.) suffices for this purpose; but, unfortunately, the lowest temperature that can be relied upon imparts to the milk a flavour that many people find distasteful. That objection does not hold good in the case of infants and young children, and the custom of boiling or steaming the nursery milk for a few minutes cannot be made too general. But while abstinence from uncooked milk is a sure way of avoiding infection with bacilli present in that article of food, it cannot for a moment be admitted that this absolves public health authorities from all concern with the subject. Arsenical beer may be made harmless by adding the proper antidote before drinking it, but the most courageous brewer would not plead this as an excuse for selling the impure article.

In conclusion, I would venture to express the earnest hope that the Congress will not endorse the view that it is inadvisable to take any measures to prevent the transmission of tuberculosis from the lower animals to human beings. To justify the introduction of measures to that end it is not necessary to contend that this is a common method of infection, or that the danger arising from milk can for a moment be compared with that present in human sputum. The inhalation of tubercle bacilli expelled from the bodies of human patients is doubtless the great cause of human tuberculosis, and every practicable means of preventing infection in that way ought to be employed; but at the same time we ought not to concede to the milkmen the right to sell us tubercle bacilli, even if we were assured that—like Professor Koch's experimental pigs—we had nothing to fear beyond the development of "little nodules here and there in the lymphatic glands" of our necks and "a few grey tubercles" in our lungs.

WHAT ADMINISTRATIVE MEASURES ARE NECESSARY FOR PREVENTING THE SALE TO THE PUBLIC OF TUBERCULOUS MEAT?[1]

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WHEN I was asked to open a discussion at this Congress on the administrative measures which are necessary for preventing the sale to the public of tuberculous meat it was at once obvious to me that no new material, no new fact, could be submitted to the meeting. The measures which are necessary are well understood by those who have directed their attention to the subject and what is wanted now is not the knowledge by such persons of what to do but the education of the public in the necessity for adopting in this country measures which have been tried and found successful elsewhere. In England we are always slow to modify our procedure and in any matter which is held to affect a trade interest especially slow, for this interest at once provides an opposing force which renders the education of the public difficult. This force is able to manifest its power from the beginning and at a time when the public concern themselves little with the subject. It is only at a later stage that the public find that they have an interest at stake and that they must bestir themselves to put law makers and law administrators in motion. When once this position is arrived at we may look forward to success. Our Congress may do much by discussion of this subject to create a wider interest in it and by influencing public opinion to bring about the result which is hoped for by those who see the need for better supervision over meat-supplies.

It is not within our province in this section to consider whether or not the consumption of the meat of tuberculous animals is prejudicial to man. The title of the subject which I am invited to discuss implies that tuberculous meat must be excluded from the food-supply. This question has been considered by two Royal Commissions, the second of which was presided over by our chairman, Sir Herbert Maxwell. I shall later have to mention the conclusion at which this Commission arrived, and this because it has a necessary bearing upon the sort of administration which is needed, but I shall accept its conclusions and shall not enter into a discussion of pathological questions. I may, however, in commencement, briefly refer to the frequency with which tuberculous diseases affect cattle and the proportion of those which are slaughtered which must be deemed to be unfit for human food. If animals were rarely affected with this

[1] A paper communicated to the British Congress on Tuberculosis, Section I., State and Municipal.

disease, it might be difficult on this ground to claim the institution of an administration to prevent the sale of their meat to the public. This, however, is not the case, and it will suffice in evidence of this contention to quote the figures published by the first Royal Commission. This report shows that during a period of four years in the Copenhagen slaughter-house 17·7 per cent. of oxen and cows and 15·3 per cent. of swine were found to be tuberculous, and that in the Berlin slaughter-house in one year 15·1 per cent. of oxen and cows and 15·5 per cent. of swine were found to be tuberculous. Of the oxen and cows in the Berlin slaughter-house 1·26 per cent. were condemned on account of tuberculosis and 0·23 per cent. of swine. The report further says that the Commission has reason for thinking that in this country "the facts about tuberculous animals would exhibit a broad resemblance to the foregoing if such records could be obtained." The figures obtained from public slaughter-houses in England are in no way conclusive of the amount of animals intended for food which are tuberculous or which are found to be unfit for human consumption. At the present time there is no need for the owner of an animal presenting signs of disease to have it slaughtered under conditions which would ensure its inspection. He can easily kill it elsewhere. I may state that among 18,440 cattle slaughtered in the Manchester public slaughter-house in 1896, 48½ carcasses of cows and three carcasses of bullocks were condemned on account of tuberculosis, or about 0·3 per cent., being but about one-quarter of the proportion condemned in the Berlin slaughter-house. Mr. James King, the veterinary inspector of Manchester, who supplied the figures relating to that city, stated to the second Commission that very few cows are sent to the public slaughter-house from the country round. "People," he said, "are a little frightened to send cows to the abattoirs. They do not care to send them in where there is rigorous inspection. The cows go [he thought] to the districts outside, because the Manchester market received a greater number of cows dressed than live cows coming to the abattoirs. The carcasses are brought in if it is thought they will pass in the Manchester market, and no doubt if they are badly diseased they are retained outside. That [he said] is my opinion about the matter." Mr. King is an officer of much experience, and his statements suffice to show that we must not assume that only one bovine animal in every three or four hundred is unfit for human consumption, for those entering the Manchester slaughter-house must be regarded as exclusive of a number which the owners believe to be too diseased to submit to inspection. It would be interesting to know what happens to those which are "retained outside," but for the moment I am concerned only to show that the proportion of cattle in this country which are tuberculous and which are unfit for human consumption is so large that if the public desire to avoid the consumption of their flesh they must provide an administrative system for the purpose. I may add the figures of another city to the above, taken also from the report of the second Commission. Dr. E. W. Hope, medical officer of health of Liverpool, stated that of 16,340 cattle slaughtered in the public slaughter-houses the carcasses of 214 were destroyed on account of tuberculosis—i.e., about 1·4 per cent., or about the same proportion as in Berlin. In the two cities which I have referred to it has not been the practice to condemn the flesh of all animals which have suffered from tuberculous disease. In Manchester Mr. King stated that "if the disease is generalised the whole carcass is condemned; if it is only localised the localised part is removed and the remainder is passed." In Liverpool Dr. Hope said that if the disease were confined to the lung and the carcass generally was deteriorated then the carcass is seized, and it is also seized if the disease is very extensive and the carcass is not deteriorated.

I may now turn to the consideration of the amount of tuberculous disease which must be deemed to render the flesh of animals unfit for human consumption. Turning first to Germany, we find the practice is as follows. In Prussia the law of 1892 provides that (1) the flesh of tuberculous cattle is deemed unfit for food if it contains tubercle or if the tuberculous animal is emaciated, although there may be no tubercle in the flesh; and (2) that the flesh of tuberculous cattle may be considered fit for food if the animal is well nourished and (*a*) the tubercle is found solely in one organ, or (*b*) in the event of two or more organs being diseased these organs lie in the same cavity of the body and are directly connected with each other either through the lymph-vessels or through blood-vessels, which do not belong to the general circulation, but to the lungs and portal circulation. In Bavaria the law of 1892 provides that the flesh of cattle and swine shall be deemed fit for food if the tuberculosis is localised and in the first stage of development and the animal is in a well-nourished condition. The flesh is to be considered unfit for food if the animal is suffering from generalised and advanced tuberculosis and at the same time shows signs of emaciation. In Saxony the law of 1892 provides that the flesh of a tuberculous animal is to be deemed unfit for food (1) if the tuberculosis has so far developed as to lead to emaciation and if the flesh differs in appearance from that of healthy flesh; (2) also if the same is generalised—i.e., if the spread of the tuberculous processes in the body can have taken place only by the circulation of the blood (excepting the portal circulation) and at the same time emaciation exists in a high degree, or the meat, or the bones, or the lymph glands belonging thereto are impregnated with tubercle; and (3) also if the disease is in the form of a generalised miliary tuberculosis with fever. In France the law of 1888 prohibits the sale of the flesh of tuberculous animals—(1) if the lesions are generalised—i.e., not confined exclusively in the visceral organs and their lymphatic glands; and (2) if the lesions, although localised, have invaded the major portion of a viscus or show themselves by occurring on the walls of the thoracic or abdominal cavities.

The second Royal Commission recommended that the entire carcass and all the organs should be seized if (1) there is miliary tuberculosis of both lungs; (2) when tuberculous lesions are present in the pleura and peritoneum; (3) when tuberculous lesions are present in the muscular system or in the lymphatic glands, embedded in or between the muscles; and (4) when tuberculous lesions exist in any part of an emaciated carcass, and that the carcass, if otherwise healthy, shall not be condemned, but every part of it containing tuberculous lesions shall be seized (*a*) when the lesions are confined to the lungs and the thoracic lymphatic glands, (*b*) when the lesions are confined to the liver, (*c*) when the lesions are confined to the pharyngeal lymphatic glands, and (*d*) when the lesions are confined to any combination of the foregoing but are collectively small in extent. In the case of the flesh of the pig it is recommended that, in view of the greater tendency to generalisation of tuberculosis in that animal, the presence of tuberculous deposit in any degree shall involve seizure of the whole carcass and of the organs.

If we may assume that it is necessary in the interest of the public health to enforce the requirements of these laws and recommendations—and I see no reason for any other view—we are obliged to consider the course which should be adopted for that purpose. The law in England as to meat inspection differs at the present time materially from that of other countries. In England the responsibility of determining whether the flesh of animals is fit or unfit for human food is cast upon the butcher. He is presumed to have sufficient knowledge for that purpose, and the duty which is cast upon the sanitary authority is to see that he exercises his judgment properly. If he is found offering for sale meat which is unfit for food he cannot claim ignorance as his excuse; his meat is seized and he is subjected to penalty. The alternative method, which is that adopted in other countries where there is systematic meat inspection, casts the duty of determining whether the meat is fit for human food on the local authority. The butcher brings to them the live animal which he is going to slaughter or the flesh of the slaughtered animal, and they determine whether or not it shall be sold for food. While in England, therefore, meat is only occasionally inspected before sale in the countries referred to it is always inspected before sale. Which of these two methods is fairer to the public and to the butcher? Obviously it is impracticable to require all butchers to possess the knowledge which is implied in the regulations as to the meat of tuberculous animals which I have stated above, and, further, it is practically impossible to ensure that each of them will observe these regulations unless complete machinery is provided for this purpose. What then, have other countries done in this matter?

For what follows I am largely indebted to Professor Ostertag's excellent work on meat inspection. In Belgium the law of 1890 requires that all animals, including pigs, whose flesh, intestines, fat or blood is intended for human food, must be examined, after slaughtering, by an expert who is either appointed by the town or, if this does not occur, by the Government for the commune in which the slaughtering

takes place, and the communes may require inspection of the animal before slaughter. The conditions under which this is to take place are prescribed by the commune which also bears the cost. The inspection is generally made by veterinary surgeons. Inspection of the carcass and viscera must take place at the latest within 12 hours of the slaughtering in summer and 24 hours in winter, and the carcass must not be cut up before inspection. The abdominal viscera must be taken out before the arrival of the expert and so preserved that their connexion with the particular carcass can be recognised; in the case of solipeds, the thoracic viscera, the bronchial tubes, and the larynx must remain in their natural position. If after the examination the meat, viscera, &c., are found to be healthy the expert must stamp them with an approved stamp, in large animals on at least every quarter and in small animals on at least every half. If on examination the whole or part of the animal is considered to be unfit for food notice has to be given to the burgomaster who gives orders as to what shall be done with the carcass. If the owner of the animal is dissatisfied an appeal is provided. It is unlawful to sell meat which has been slaughtered contrarily to these regulations, and in the case of meat brought in from outside it is required that it shall only be the whole, or the half, or the quarter of the carcass, and the lungs must remain in their natural position; all must be examined and stamped. In Southern Germany, in part of Western and part of Central Germany, and in the free cities of Bremen, Lübeck, and Hamburg there is regulated meat inspection. Animals intended for human food must be examined before and after slaughter, in some places exemption being made for very young animals. In Northern Germany the conditions are not the same, obligatory meat inspection being required in some parts, including Berlin, and not in others, examination for trichinosis alone being practically general. In Brunswick and Saxony, since 1898, however, meat inspection is obligatory throughout, the law being very similar to that of Belgium.

In Sweden and Norway there have been laws requiring the provision of communal slaughter-houses since 1892 and since 1895 requiring meat inspection in the towns. Public slaughter-houses have, however, not been provided. In Norway there is at the present time, Dr. Bentzen informs me, only one public slaughter-house—viz., at Christiansund—and in Sweden, I learn from Dr. Linroth, there is no public slaughter-house, but they are now proposed in Stockholm and Gottenburg and a few smaller towns. In Denmark Professor Ostertag states that in 1899 there were public slaughter-houses and meat inspection in seven towns. In Austro-Hungary he says that the law requires the inspection of slaughtered animals, but the method of administration had prevented uniformity of action. In Italy he writes that a good scheme for meat inspection became law in 1890, but the regulation of meat being left to the provincial authorities has made a thorough reform impossible. The law requires the inspection of all animals intended for the food of man, the erection of public slaughter-houses in towns of more than 6000 inhabitants, and the stamping of meat, including the inspection of imported meat.

It is thus seen that already there is obligatory inspection of meat in some countries and that other countries are adopting the same course. I am not exaggerating the position if I say that the trend of opinion and of law in civilised Europe is to require that meat intended for human food shall be inspected by competent persons before it is sold for this purpose. All countries are not equally advanced in this matter, delay being often caused by the want of provision of the one condition which is essential to the carrying out of this intention—the provision of public slaughter-houses. I need not point out the absolute necessity of this provision, if effect is to be given to the recommendations of the Royal Commission on Tuberculosis, or the requirements of laws which have been adopted in other countries. So long as animals may be slaughtered in numerous private premises in our cities inspection cannot be carried out. The inspector must be present at the time of slaughter so as to ensure that regulations as to what is to be deemed fit for food and what is to be deemed unfit for food shall be complied with and to prevent the dishonest butcher from practising those arts which give to meat a fictitious appearance and which are well known to those who have experience of meat inspection. This is becoming generally recognised, and in Prussia, Professor Ostertag tells us, public slaughter-houses have in the last 20 years "literally grown out of the earth," so much so that in 1897 there were 321 public slaughter-houses in that kingdom and 40 were provided in the period 1895–97. This provision is, of course, required for other reasons than those which relate only to the prevention of tuberculous disease in man, but we may here claim that it is absolutely necessary on the score of the disease which this Congress is especially considering. It is the want of public slaughter-houses which stands in the way of effect being given in some of the continental countries to their law of obligatory meat inspection; it is the opposition to public slaughter-houses on the part of the butchers which is the chief obstacle to the institution of a system of meat inspection in this country.

I may therefore briefly refer to the objections which have been urged by the butchers' trade to the replacement of private by public slaughter-houses. One of these objections is that the price of meat would be increased. The effect in Germany of the system of slaughter in public slaughter-houses and of meat inspection has been carefully considered by Osthoff who came to the conclusion in 1894 that the cost of the administration represented a sum less than about one-half of a farthing in the pound of meat. This is obviously a price of no practical importance when considered as a set-off against the advantage of the exclusion from sale for human food of meat which is unfit for the purpose. Dr. Schwartz, director of the town slaughter-house and cattle-market at Stolp, however, writing later, says: "The fear whether such establishments [public slaughter-houses] would pay or possibly cause an increase in the price of meat has been found to be quite groundless and has long been disproved. That this latter cannot be the case is conclusively proved by the experience of many years which individual communes possess; on the contrary, one may rather maintain that the prices have gone down, since the quality of the meat has improved, but the price has remained the same, apart from the general rise in the prices of food." It has also been urged that the meat killed in public slaughter-houses would be less well cared for than the meat killed in private slaughter-houses. Such argument would not be used by those alike familiar with the procedure in public slaughter-houses on the continent and of private slaughter-houses in this country. Compare for a moment the difference between the opportunity given for slaughter in a well-appointed slaughter-house fitted with every convenience and with cold chambers, to which the carcasses are removed, with the opportunity which exists in the small outbuildings and sheds in the rear of private houses in an English town. It has been urged that the offal which is consumed by the poor would be lost if the animal be slaughtered in a public slaughter-house. This, again, the experience of the public slaughter-houses of the continent shows, has no foundation. It has been urged that the butcher who has a private slaughter-house is able to employ his men at one time in slaughtering and at another time in his shop or calling for orders. There is no reason why, if the butcher prefers it, they should not be equally employed in the public slaughter-house as in the private slaughter-house. It has been urged that if there were no private slaughter-houses there would be risk of a "ring" being formed to the detriment of the public. Obviously the best safeguard to the formation of a ring is to give to everyone selling meat the opportunity to slaughter his own animals. At the present time in London only a small proportion of meat vendors have this opportunity, and the rest depend, in the main, upon the middleman. They have no opportunity of slaughtering.

It has been said that the effect of the replacement of private by public slaughter-houses would tend to the exclusion from the meat market of English-grown cattle. Obviously so far as London is concerned the result would be the opposite, for every meat vendor would be able to purchase his own meat alive, instead of depending upon middlemen who may prefer to supply him with the meat of foreign animals. I am satisfied that the use of the public slaughter-house is directly in the interest of the butcher who would save in expense and who would be able especially to save by using the meat-cooling chambers associated with it. I recently made some inquiry as to the cost incurred in London by London butchers in providing ice for their ice-safes in hot weather. The amount is enormous and for this the public have eventually to pay in the price of the meat they purchase.

It has been asserted that public slaughter-houses will be a charge upon the public purse. This, again, is not in accord with continental experience. At the time when the second Royal Commission on Tuberculosis was sitting several of its

members, including its chairman, visited a number of public slaughter-houses on the continent and reported that "all the public slaughter-houses in Germany are self-supporting." A commission in Saxony, appointed in 1893, investigated the subject of the finances of public slaughter-houses. They reported that—

As soon as the project [the establishment of public slaughter-house] is mentioned—the butchers (the traders most interested therein) almost always oppose it, fearing various inconveniences to which their trade may be subjected in connexion with a public slaughter-house and its compulsory use, not the least of which is the stricter control of their business which comes with a public slaughter-house. Added to this, they raise the question of cost and they hold out the prospect of an increase in the price of meat—a fact which carries weight with the public and with the representatives of the community. But if public opinion is not influenced by this opposition and by these fears of the butchers, and if the leading citizens are of opinion that a slaughter-house is necessary, the butchers almost always abandon their opposition suddenly, recognise the necessity of a slaughter-house, and at the same time demand the right to build, arrange, and administer it themselves. Apart from other reasons not necessary to discuss here the finance question is placed in the front rank by the butchers. While they seek to attack the citizen on his weakest side, the not inconsiderable cost of building, arrangement, and administration of a public slaughter-house is unduly brought forward by the butchers, and the prospect is held out of a heavy charge on the finances of the town, increased taxation, &c. It is important to emphasise that the establishment of a public slaughter-house is in no way prejudicial to the finances of a town or increases the taxes of the citizens, but that the funds devoted to the building and management are a very good investment. This the butchers' guilds and other persons who offer to build slaughter-houses know very well, and with this reason strive with all their might that this favourable financial project shall not escape them. But in this financial matter the local authority has a predominant interest.

The Commission states that the receipts, without burdening the trader with heavy fees, provide, after payment of expenses, an interest of from 5 to 6 per cent. as well as a contribution to a sinking fund which will extinguish the debt in from 35 to 40 years.

I have dwelt upon this financial question at some length because only a few years ago London went through the first phase which the Saxon Commission describes. In England, therefore, we must, if we are to prevent the sale of tuberculous meat to the public, provide for and insist upon the slaughter of all animals intended for food in public slaughter-houses and we must provide competent meat inspectors for that purpose. The question has to be considered to whom shall this duty of meat inspection be entrusted. It is perfectly clear that the work must devolve upon those who have as a basis of the knowledge of meat inspection a knowledge of pathology, and this at once narrows the question down to the selection of members of one of the two professions having such knowledge—the medical and the veterinary. I do not think that in this country we shall ever relieve the medical officer of health of the duty of determining what is to be deemed fit for the food of man, nor is it desirable that this should be done; but in the actual carrying out of the work I believe we should do well to enlist much more than we have done in the past the services of members of the veterinary profession, and that we shall find that as they qualify themselves for this special duty they will be able to serve the purpose which we have in view.

In conclusion, then, I may say that the time has fully come when we should follow the excellent example which has been set us by other countries, that we should require all the animals which are killed in urban districts for human food to be slaughtered in public slaughter-houses, where there can be inspection before, at the time of, and after slaughter of the animal, that the meat shall be stamped, and that the public should be taught to look for this stamping as the test of wholesomeness rather than have to rely upon the pathological knowledge of the butcher and the housewife. Further, that all meat which has been killed outside a district, other than that which may have been killed in some public slaughter-house and which bears the evidence of inspection, shall be taken to meat-inspection stations for examination. Greater difficulty no doubt attends the inspection of meat in village communities, but even in such sparse populations the veterinary surgeon is to be found, and it is quite possible to organise a system by which his services are available when animals are killed for food. We are not now concerned with any question of other disease than tuberculosis, but I may refer to the enormous gain which it would be to the community to exclude from the human food-supply the meat of diseased animals which now can, practically without let or hindrance, find its way to the consumer. It would prevent, what has been within my own knowledge, meat from knackers' premises being sent regularly to London from the provinces, and it would ensure to the poor people among us that in purchasing meat they were receiving the value of their money. It would, however, do much more than I have stated, and especially in respect of tuberculosis, for in closing the door to the ready disposal of the meat of tuberculous animals it would compel the stock-owner to take steps to prevent the infection of his herd and would lead to the earlier exclusion from the milk-supply of animals manifesting symptoms of tuberculosis, for the interest of the cow-owner would be to slaughter them before disease became advanced.

I beg to move:—

That, in the opinion of this section, the meat of all animals intended for human food should be inspected before being sold for that purpose, and that in all urban districts, and in all rural districts as far as possible, such animals should be slaughtered in public slaughter-houses, so as to ensure efficient inspection.

THE VETERINARY WORK DONE UNDER THE MILK CLAUSES IN MANCHESTER AND THE DIFFICULTIES MET WITH.[1]

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BETWEEN the dates Jan. 11th, 1900, and April 30th, 1901, the number of farms from which samples of mixed milk have been taken at the Manchester railway stations or *en route* to the city has been 401. Of these 259 are situate in Cheshire, and from 42 of these (or 16·21 per cent.) tuberculous milk has been sent to Manchester; 41 are situate in Staffordshire, from one of which (or 2·44 per cent.) tuberculous milk has been sent to Manchester; 93 are situate in Derbyshire, from four of which (or 4·3 per cent.) tuberculous milk has been sent to Manchester; whilst three are situate in Salop and five in Lancashire, all of which were free from tuberculous infection. From figures supplied by the farmers themselves to the public health office, the estimated number of cows kept at these 401 farms is 8408 or an average of nearly 21 cows per farm.

The total number of farms from which tuberculous samples have been sent is 47 (or 11·72 per cent). At 31 of these 47 farms 35 cows with tuberculous udders have been found. At 15 of these farms no cows having diseased udders could be found, and subsequent control samples of the mixed milk from these farms have all been reported free from infection after being tested by Professor S. Delépine. In one instance the result of inoculation is undeclared. At most of these farms the owners have admitted selling cows from the farms between the date of the taking of the mixed sample at the station and the date of the visit of the veterinary surgeon, but only in two or three instances have the owners admitted that the cows sold were diseased, and in only one case has a farmer admitted that the cow had a diseased udder. In three of these instances the farmers stated that they also sent the milk from a neighbour's cows together with the milk from their own cows, and in two cases these were followed up, but with negative results. At the remaining one of the 47 farms samples of the milk from suspicious cows are still in process of examination.

To give the percentage of cows having tuberculous udders among the cows represented on the 401 farms from which the mixed milk sent into Manchester was tested it will be necessary to strike out the 15 farms at which no cows with tuberculous udders could be found and also the one farm from which the milk from suspicious cows is still under investigation. The average number of cows will then be represented by $\frac{31}{47}$ of 8408 = 5545, which, taking 35 cows at the 31 farms, gives a percentage of 0·63.

The total number of cows clinically examined as the result of following tuberculous samples of mixed milk is 1308, but the number of cows examined irrespectively of previous samples of mixed milk is 4031. Of these 2182 were examined in the Manchester cowsheds, and among them eight cows were found to have tuberculous udders. This gives a percentage

[1] A paper communicated to the British Congress on Tuberculosis. Section I., State and Municipal.

of 0·36. The remaining 1849 cows were examined in cowsheds outside Manchester, and among them nine were found to have tuberculous udders, equal to a percentage of 0·48. If we add up the number of cows thus, 5545 + 2182 + 1849, we have a grand total of 9576 cows the milk from which was tested for tuberculosis or among which cows with tuberculous udders were found by clinical examination; and by adding up the figures 35 + 8 + 9 we have a total of 52 such cows having tuberculous udders, which is equal to an average percentage of 0·54.

According to the agricultural returns for 1900 the number of cows and heifers in milk or in calf in England was 1,899,623. If we take 0·54 per cent. of these to have tuberculous udders we have a total for England of 10,257. Or if we take the figures for Great Britain on the same basis—viz., 2,620,901 at 0·54 per cent.—we have a total of 14,152 cows with tuberculous udders. For administrative purposes the statistics will show a much lower proportion of tuberculous cows—viz., 35 out of 8408, or 0·4 per cent.

Regarding the disposal of the 52 cows mentioned, the particulars ascertained are as follows. Of the eight city cows having tuberculous udders, two are isolated and are still in the possession of their owners, who have promised to slaughter them ultimately in the presence of the veterinary surgeon. The remaining six have been slaughtered at the Water-street abattoirs; three of the carcasses were passed as fit for human food and three were condemned as quite unfit and were destroyed. Of the nine cows found outside the city, irrespectively of previously tuberculous mixed samples, five have been slaughtered, one of the carcasses being passed as fit for human food; the other four, being totally unfit, were destroyed or buried. The remaining four of these nine cows were disposed of by the owners and could not be traced. Of the 35 cows with tuberculous udders found by following up tuberculous samples of mixed milk, 15 have been slaughtered; three have been passed as fit for human food, two as partially fit, the unfit parts being destroyed; 10 have been condemned as unfit, four of which went to the knacker's yard, five were buried, and a portion of the other was subsequently discovered to have been sent into Manchester for human food. Of the remaining 20 out of the 35 seven are stated to have been fed and sold for slaughter, seven have been disposed of but have not been traced, and six are still in the possession of their owners. Four of these owners have promised ultimately to have their cows slaughtered in the presence of the veterinary surgeon. Thus out of these 52 cows with tuberculous udders only 26 have been definitely proved to have been slaughtered; the remainder, due to the absence of any compulsory power to deal with them, are either still in the possession of the farmers or have been sold by the latter, some it may be for slaughter, others probably to milk elsewhere. At any rate, nothing definite or trustworthy can be ascertained as to their ultimate disposal. It will thus be seen that against the successful working of the milk clauses certain difficulties have been found to arise, and I will now proceed to deal with each one shortly:—

I.—The first difficulty is where, on following up a tuberculous station (mixed) sample of milk to the farm, no cow is found exhibiting signs suspicious of tuberculosis.

1. In several instances where this has been the case the farmer has admitted selling cows from his farm between the date of inspection and the date of taking the sample. But, although in a few cases he has admitted that he had sold a diseased cow or a cow which he states has not been doing well, he has only in one instance admitted selling a cow which he knew to have a diseased udder.

2. Another possible difficulty which has been met with is where the farmer also sells milk from his neighbour's cows mixed with the milk from his own cows. In a few cases this has come under my notice. In one case I failed to follow this up, but in the remainder of the cases when followed up, I failed in each instance to discover a cow with a tuberculous udder. Still it is quite possible that contamination could be produced in that way.

3. Another reason for tuberculous infection in milk, and one which has been brought to the notice of the Council of the Royal Agricultural Society of England, is external and accidental contamination. It is possible, perhaps, that a consumptive herdsman or railway porter might infect the milk, but I think that it is not probable, and the committee appointed to consider the question by the Royal Agricultural Society of England did not attach any weight to this point. Another external source of contamination has been considered by Dr. J. Niven, and that is contamination by dirt in the cowshed. When we consider the dirty condition of some cowsheds and some cows, together with the fact that one of the cows may be suffering from tuberculous muco-enteritis, it is quite conceivable that the dirt on the cow's udder may convey to the milk the bacilli given off in the discharge from the bowels of the diseased cow or, it may be, from the matter coughed up by a cow suffering from pulmonary tuberculosis. Still, in these latter cases the presence of the diseased cow in the herd should not escape the notice of an observant veterinary surgeon. In all cases (19) where I have been unable to find the cow with the diseased udder at my first visit to the farm a control sample of the mixed milk from the cows on the farm has been taken for a second bacteriological examination by Professor Delépine. In 15 of these cases the milk was reported as being incapable of producing tuberculosis, whilst in four instances the milk was still found to be infected, thus proving that the source of infection was still present. In these cases I again visited the farm, and in three cases, after a very lengthy examination both previously to and after having the whole herd milked, I have discovered a cow showing slight signs of disease about the udder, but in no one were the symptoms at all typical of tuberculosis. In each instance, however, a sample of milk from these cows was found when examined by Professor Delépine to contain tuberculous infection and to be capable of producing disease in test animals. The milk from suspicious cows on the other farm is still under investigation. That brings me to the next point—another reason why the cow with a diseased udder may not be found on the first visit of the veterinary surgeon to the farm.

4. There is sometimes a difficulty in diagnosis. Several authorities, including, I think, Professor Bang, have stated that a tuberculous cow can give tuberculous milk without having tuberculous disease of the udder. That is not my opinion. I can quite conceive that a cow with an udder apparently free from tuberculous disease can give tuberculous milk, but my experience with several such cows is that, if the cows are kept under observation for a short time (from one to three months) it will be found that the symptoms of the disease in the udder of the implicated cow will begin to be manifest. That has been my experience in other cases besides the above three. In one case I took a sample of milk from a cow suffering from chronic pulmonary tuberculosis, the udder at the same time appearing healthy. That sample was examined by Professor Delépine, and he reported that it had caused tuberculosis in test animals. The cow was again examined by me in five weeks after the first examination, when I detected a slight atrophy of one hind quarter together with very slight induration of the same quarter. After consultation with Dr. Niven and Professor Delépine I again examined the cow in a fortnight, when the induration was a little more pronounced. I then took a separate sample of the milk from each teat, and these samples were examined by Professor Delépine. He reported that the milk from the suspicious quarter only had caused tuberculosis in test animals. I have also examined the udder of this cow on a subsequent occasion, when I found that the diseased quarter of the udder had become equal in size to the opposite healthy quarter. In another case I have obtained tuberculous milk from a "wasting" cow, but in this instance after the cow was milked a very slight hypertrophy of one half of the udder could be found, but only by very careful manipulation and visual examination. In several other cases I was only able to find the suspicious udder after the animal had been almost completely milked.

The conditions and symptoms met with in cows suffering from tuberculosis of the udder differ very considerably, both ante-mortem and post-mortem. In addition to the obscure cases just mentioned the symptoms presented in fairly well-marked cases differ very widely during life. For instance, I have met with a tuberculous udder in a two-year-old heifer, and several in four-year-olds, although the majority were in aged cows. Again, the bodily condition of the cow is no criterion, as I have discovered tuberculous udders in fat cows as well as in cows in fair condition and in "wasters." The condition of, or symptoms presented by, the diseased udder itself I have also found to vary considerably. As a rule, the disease is most frequently manifest in one or both of the hind-quarters of the udder, occasionally I have found it in the fore-quarters, and in several instances both quarters of the same side have been affected. In one case I found the disease very well marked in the right hind-quarter and the

left fore-quarter, whilst the other two quarters were apparently free from the disease. Again, the diseased portion of the udder is generally hypertrophied, but in several instances I have found well-marked, really typical cases where a diseased quarter has been atrophied and where the secretory powers of the organ were to a greater or less extent destroyed, the milk being in most of these instances small in quantity and changed in appearance, the latter varying from thin normal-coloured milk to a mud-coloured liquid, and in a couple of instances to an amber-coloured serum. In all of those atrophied quarters the gland structure had been replaced by a hard tuberculous deposit, and they were also associated with the disease in at least one other quarter of the udder. In the amber-coloured serum mentioned above Professor Delépine found tubercle bacilli by microscopic examination.

In all cases of tuberculosis of the udder that I have met with I have been able to find some amount of hardening or induration. The amount has been very variable, as has been also the position or portion of the quarter affected. As a rule, the supra-posterior portion of the hind-quarter has been the seat of this induration, in most cases it has been fairly superficial, whilst in a few it has been more deeply seated, and in two or three instances I have found a small indurated mass only near the base of one of the hind teats, and placed either inward or forward to the ampulla of the teat. In the three instances where I was unable to find the cow with a diseased udder at my first visit to the farm I did not notice this induration, except at the second visit, and from this fact I conclude that this induration is subsequent by some weeks to the invasion of the udder by the tubercle bacilli, but that the milk from such an udder is infective before any sign can be detected, so as to contaminate the milk from an entire herd. In prosecutions under the milk clauses for failure to notify tuberculous udders, the question is usually asked by the defence as to the probability of the defendant knowing that his cow exhibited symptoms suspicious of tuberculosis of the udder. It is possible from the character of the induration to say if it has been of some standing. In more recent cases of tuberculous invasion of the udder, however, the nodular character of the induration is not so marked; it may appear of a granular character to a practised hand, often it is very diffuse, and if accompanied in that stage by little or no hypertrophy it is then easily confounded with what is termed a "fleshy udder." In these latter cases a milk-seller could hardly be expected to suspect tuberculosis and particularly, as is often the case, when the cow seems otherwise a healthy beast. But in these cases also he will often detect some change, and in order to protect himself he should seek the advice of his veterinary surgeon or notify the case to the proper authority and so keep himself within the law. Although the disease is usually chronic and unaccompanied by any acute symptoms I have in several instances met with cases where the disease has suddenly become acute, and from an old-standing disease in one quarter suddenly attacked the whole organ. In one case where a cow with a tuberculous udder has been isolated since January last I noticed on a recent visit (May 7th) that although the cow had calved in the meantime I could detect practically no alteration in the diseased quarter of the udder from what I had noticed when the cow was examined in December. There is still one other form in which I have found two cows suffering from tuberculosis of the udder, and that is where the udders were the seat of catarrhal mastitis of a tuberculous nature, and in the pus from which Professor Delépine found tubercle bacilli by microscopic examination. It should be added that other samples of a like nature were examined with a negative result. Before passing on to note shortly several conditions of the udder which may be confounded with tuberculosis I may point out that in all cases where I have found cows with tuberculous udders the diseased animals had all been in the possession of their respective owners for some considerable time, many of the country cows having been reared by the owners.

A very common condition met with in milking cows, particularly what may be called tied-up or stall-fed cows, is atrophy of one half of the udder, caused by continually lying upon one side only. The pressure of the cow's body forces the milk from the side of the udder next the ground, and the gland gradually becomes, to a variable extent, atrophied. This often gives the opposite half of the udder an enlarged appearance. A true hypertrophy of one part of the udder also follows a case of mammitis, where one or more quarters lose their functional activity, constituting lost quarters, and the other healthy quarters take on compensatory action and become hypertrophied. When these lost quarters waste completely away they are of no moment, except to depreciate the market value of the cow; but when the lost quarter is replaced by an indurated mass, as I have pointed out before, there is a possibility that they are tuberculous in that case; but then, in my experience, they have been accompanied by tuberculosis in one or more of the other quarters of the udder. Abnormal, but not pathological, hypertrophy of one or more quarters is also sometimes met with in milking cows, and especially is this so when supernumerary teats are present. But in all such cases, if the hypertrophy is of a non-tuberculous origin there has been an absence of chronic induration (with the exception of one which I will shortly describe) and the milk from the hypertrophied quarters of the udder has been non-infective when tested by inoculation into test animals. In all doubtful cases I have no hesitation in stating that I believe the inoculation test as carried out in Manchester to be absolutely infallible, and that it is as delicate as it is true, as proved in several cases to my knowledge where it has demonstrated tuberculous infection in both mixed milk and milk from special cows several weeks before the symptoms of the disease in the infected cow's udders became manifest.

The one condition of chronic induration which I have just mentioned is that caused by chronic interstitial mammitis. This affection of the udder is often a result of acute mammitis, but, according to the late Professor Walley, it may be interstitial in its character throughout. Owing to the amount of interstitial tissue formed the affected udder becomes indurated and often markedly hypertrophied. At the same time the secretory power of the glandular tissue is destroyed, and the milk secreted gradually becomes less and finally stops. Such a case I have had under observation for some time and a short account of it will, I think, be interesting. The subject is a Galloway cow about six years old, which was first seen by me in October, 1900. The animal had then been bought about a fortnight as a fresh calver. The right hind-quarter was a little hypertrophied and considerably indurated. I considered the case to be very suspicious and took a sample of the cow's milk. This was examined by Professor Delépine, and he reported that it had failed to cause tuberculosis in test animals. I again examined the cow at the end of November, when the condition of the udder was not materially changed and took another sample of her milk, which also was reported negative by Professor Delépine. Early in January, 1901, I again examined this cow's udder when I noticed that the induration seemed to be of a corded character, something like the feeling under the skin of an animal's trachea. With the owner's consent I tested the cow with tuberculin, when the animal passed the test. Samples of her milk were taken just previously to testing and again 12 hours later, also with a negative result. Just previously to testing the owner informed me that the cow was not giving so much milk from the indurated quarter as from the others—at first no diminution was noticed. The quarter gradually became harder and more corded in character, at the same time that the quantity of milk secreted became less, and the quarter ultimately became dry.

II.—The second difficulty met with in working the milk clauses is failure on the part of the farmers and cowkeepers to notify to the medical officer of health the presence in their dairy of a cow "affected with, or suspected of, or exhibiting signs of tuberculosis of the udder," as required by sub-section 4.

III.—The third difficulty which has arisen in connexion with the working of the milk clauses in Manchester is due to the absence from them of any specific powers for dealing with cows suffering from tuberculosis of the udder after they have been found, and the tuberculous nature of the disease in their udders has been definitely proved. The procedure adopted by the medical officer of health in Manchester has been to advise immediate slaughter of cows which have been definitely proved to have tuberculous udders. In the case of exactly half of the 52 cows found to have diseased udders (26) this has been carried out. Six of the eight cows found in the city have been slaughtered at the Water-street abattoirs. The carcasses of these have been inspected by Mr. Holburn, the chief meat inspector, by whom three were passed as fit for human food and three were condemned as being unfit. The remaining 20 cows were slaughtered at different places in the country either in my presence or in that of Mr. Holburn. When the carcasses were inspected six were passed as fit for

human food and 14 were condemned as being unfit. It may be noted that in several of these cases the animals were so far advanced with disease that the owners recognised the futility of trying to fatten them for the butcher, otherwise they would doubtless have been less easily advised to accede to immediate slaughter.

The post-mortem conditions that have been met with in the carcasses of those cows which have been slaughtered have been almost as variable as the symptoms and conditions exhibited during life. Whereas nine out of the 26 slaughtered have been fit for human food, 17 have been totally unfit. In most of the latter carcasses the diseased conditions found have been very extensive, involving in addition to the udder and the mammary lymphatic glands most of the viscera and lymphatic glands, and in many cases tuberculous lesions, varying in age and extent, have been found on the serous membranes. In a few cases large patches of tuberculous ulceration have been found on the mucous membrane of the intestines. In other carcasses which were unfit for food the disease was not so extensive, but in these cases the carcasses were thin and wasted, so much so that the owners did not have the carcasses prepared for sale, but before slaughter decided either to bury them or to send them to the knacker's yard.

In two or three of the carcasses which were fit for human food, not only were they well-nourished but, excepting the udder and its lymphatic glands, very little tuberculous lesion was present, the carcasses being sold for from eight to 12 pounds. In all these cases, however, caseous deposits could be found in the mesenteric glands, although in one or two instances it required a careful examination of several of the glands in order to demonstrate the presence of the disease to the naked eye. In all cases of tuberculous udder the mammary lymphatic glands are found hypertrophied, but in many of the cases no tuberculous deposits are visible by microscopical examination, and it is only in animals that are thin, and where these glands are much enlarged, that the condition can be detected during life.

Regarding the disposal of the remaining 26 cows matters have not been at all satisfactory. Seven of the owners elected to isolate their cows with tuberculous udders, to stop selling their milk, gradually to dry off and to fatten them for slaughter. When the animals are not far advanced with disease this can, no doubt, be done to advantage; but in the interests of the public health these cows should not be sold except for slaughter and under adequate veterinary inspection. Where the carcass fulfils the conditions suggested by the Royal Commission on Tuberculosis and recommended by the Local Government Board there is no reason why such a carcass should be condemned, although it must be borne in mind that a cow with a tuberculous udder is in the majority of cases rather far advanced with disease, and the longer she is kept for feeding purposes the more advanced the disease will become, and the less likely that the carcass will be fit for human food. In all of these seven instances the owners were asked by the medical officer of health to inform him when they disposed of their diseased cows for slaughter, so that the killing of the animals could be verified and the carcasses inspected, but in no instance was this information given, although several gave a promise to do so. In 11 instances the diseased cows were removed from the farms by their respective owners and could not be traced. Several of these cows were removed soon after my visit to the farms and after the diseased or suspicious condition of the cows' udders had been pointed out. In other cases the cows were removed as soon as the owners received the letter from the medical officer of health advising that the diseased cows should be slaughtered. In several of these cases no information regarding the disposal of the cow could be obtained; in others the owners wrote stating that the cows were sold for slaughter. In not one of such instances could the actual slaughter of the cow be verified, and in some of them it was afterwards ascertained that the buyers had sold the cows again in open market. It will thus be seen that 18 of these cows with tuberculous udders have been lost sight of, and as some of them were in calf it is quite probable that they may be giving diseased milk somewhere, possibly to be consumed in Manchester. Eight of the 26 cows are still in the possession of their owners; two of these are city cows and six belong to farmers in the country. The owners of all these have given either written or verbal promises to notify the medical officer of health as to the time when they dispose of these cows, so that their slaughter can be witnessed and the carcasses inspected.

THE RELATION OF ALCOHOLISM TO TUBERCULOSIS.[1]

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ALCOHOLISM and tuberculosis stand foremost amongst the causes hampering human progress and limiting man's happiness. Through them the evolution of the race has been impeded, and, unfortunately, in spite of numerous restraining and restricting agencies, their baneful influence is still accountable for a high degree of mortality and an immense amount of sickness and suffering. The stay of such calamitous agencies has long afforded problems which have appealed to all sorts and conditions of men, and their solution even now is to a great extent shrouded in mystery and surrounded by difficulty. With two such morbid influences barring human advance it was but natural that eager minds studying the one should have been compelled to recognise the presence and action of the other. Hence the question as to the relationship of alcoholism to tuberculosis is one of old standing. But since the answers have been hitherto by no means uniform it is particularly desirable that some approximation to the truth should be arrived at, and if possible generally accepted. The position has been well expressed by Dr. J. F. Payne,[2] who says: "With regard to the influence of alcohol on the production of tubercle, the utmost divergence and, indeed, contradictory opposition of opinion prevails. Huss found tuberculous phthisis to be rare in drunkards, and that has been the general conclusion drawn from post-mortem observations. It has even been thought that drinking freely checks the progress of phthisis, but of this I can find little evidence. On the other hand, the more general impression is that alcoholism is a frequent cause of consumption." And Dr. Payne goes on to say: "On this disputed point we must appeal to the methodised experience of those who have special opportunities of observation."

The subject, however, is one full of peculiar and unavoidable difficulties. And not the least arises from prejudices, which, however repugnant to scientific research, have only too frequently warped the minds of those who attempted an investigation of the matter. Efforts to elucidate the question by an appeal to what has been termed clinical statistics is necessarily permeated with fallacy. Purely experimental inquiry, however suggestive in the presence of modifying influences concerning which we have but little knowledge and but limited control, can afford but unreliable results. Mortality returns, although rendering material for interesting, and it may be useful, analysis, afford data too gross for anything but rough generalisations. A study by the pathological examination of a large number of cases would seem to afford the most hopeful method of research, and when combined with a discriminating clinical investigation is likely to accomplish as near an approach to the truth as we are likely to obtain under present circumstances. But before indicating the manner and results of such a method of inquiry it will be well to refer briefly to opinions and conclusions of certain authorities which, as the outcome of exceptional experience or special inquiry, may be deemed worthy of consideration; and it will be desirable that special reference be accorded to those expressions which are based on a knowledge of alcoholism and tuberculosis as they are met with more particularly in this country. Three views are possible: (1) that alcoholism is antagonistic to tuberculosis; (2) that alcoholism bears no special relationship to tuberculosis; and (3) that alcoholism definitely predisposes to tuberculosis. Let us briefly consider them.

1. *The view that alcoholism is antagonistic to tuberculosis.*—Before the true nature of tuberculosis became apparent the opinion was somewhat widely held that habits of alcoholic excess were antagonistic to tuberculosis and even preventive. This impression still exists among a large section of the public and is apparently in part due to opinions expressed by many of the earlier writers on pulmonary tuberculosis. Indeed, in some medical quarters such a view is still held. This view

[1] Précis of a paper communicated to the British Congress on Tuberculosis. Section II., Medical, including Climatology and Sanatoria.

[2] Transactions of the Pathological Society of London, 1889, vol. xl., p. 332.

was clearly expressed by Dr. R. Payne Cotton[3] many years since in his Fothergillian Essay: "It is worthy of remark that the habitual drunkard—he who is always in his cups—is not very often the subject of phthisis; such, at least, is the result of my own observations."

The idea that alcoholism was antagonistic to tuberculosis may, perhaps, in part account for the advocacy of its persistent and even excessive use in phthisis. Bennet,[4] writing some 30 years since, says: "Of late years in America alcohol, especially whisky, has been much lauded as a remedy in consumption"; but he adds: "I have seen a certain number of cases in which it had been long taken, but I cannot say with benefit. The daily ingestion of large quantities of nerve-stimulating, carbon-producing spirit certainly does not come under my ideas of hygienic treatment." Flint[5] used alcohol freely, that is from six ounces to a pint of spirit daily, and appears to have considered it beneficial, "but not in the sense of exerting a special influence upon the disease." Charteris, writing in 1877 concerning the administration of whisky to phthisical patients, says: "In private practice I order it to be taken *ad libitum*." Dr. Hermann Weber[6] in 1885 was convinced of the great usefulness of alcohol in the treatment of phthisis. Dr. Thomas Harris[7] tried the effects of whisky containing 53 per cent. of alcohol during a period of nine months. 26 cases were so treated, the doses commencing with two drachms of pure whisky gradually increased up to one and a half ounces of whisky every four hours, day and night. Dr. A. Ransome, who saw many of the cases, expresses the opinion that "at certain times of the day the dose of alcohol was unnecessarily large—for some of the patients at times were distinctly flushed and slept heavily even in the daytime." Dr. Harris states: "No case left the hospital in a worse state than that in which he entered it. As regards the physical signs, very little difference could be detected between those at the date of admission and the date of the discharge of the individual." Manifestly in no instance did "cure" occur.

Reference has frequently been made to Stokes's account of a gentleman who recovered from pulmonary tuberculosis after regularly drinking "seven tumblers of punch every night," but it is sometimes forgotten that at the same time he was duck-shooting every day that he could go out, and according to his own account "had to stand up to my hips in the Shannon for four and five hours of a winter's day following the birds."[8]

It is interesting to note that Bell of New York as far back as 1859 opposed the current view, for he then stated: "The opinion so largely prevailing as to the effects of the uses of alcoholic liquors—viz., that they have a marked influence in preventing the deposition of tubercle—is destitute of any solid foundation. On the contrary, their use appears rather to predispose to tubercular deposition. When tubercle already exists alcohol has no obvious effect in modifying the usual course it takes. Neither does it mitigate in any considerable degree the morbid effects of tubercle upon the system in any stage of the disease."[9] The abolition of alcohol from many modern sanatoria seems to indicate that, as Dr. Ransome well expresses it, "owing to the terrible consequences of excess and to the proclivity of mankind to its excessive employment it [alcohol] can only be recommended in selected cases with many cautions."[10]

2. *The view that alcoholism bears no special relationship to tuberculosis.*—Many hold that alcoholism bears no special relationship to tuberculosis and only exerts an indirect influence in so far as it leads to lowering of general vitality and places the individual under conditions particularly favourable to the infection of tubercle. And certainly the circumstances attending the life of the chronic alcoholic are generally such as to specially expose him to the risks of tuberculosis. His habits lead in great measure to an indoor existence, the maintenance of an insanitary environment, insufficiency of suitable food, oftentimes to the influence of depressing emotions, and not infrequently his indulgence necessitates his following an occupation under conditions which are peculiarly inimical to health. Thus, while the overcrowding, neglect, uncleanliness, malnutrition, and nerve influences cannot be overlooked, considerable difficulty attends any attempt to estimate the effect of alcohol *per se* in rendering the tissues peculiarly vulnerable to the tubercle bacillus.

3. *The view that alcoholism definitely predisposes to tuberculosis.*—The view that alcoholism definitely predisposes to tuberculosis has of recent years received much support. Indeed, the tendency of modern opinion is to recognise alcohol as an agent which renders the tissues specially prone to tuberculous infection. This is well exemplified by such recent expressions as the following: Dr. Hector Mackenzie in a recent article on Tuberculosis[11] declares that "alcoholism must be regarded as a powerful predisposing cause of tuberculosis. ... It is almost invariable to find tubercle present in the lungs in patients dying in the course of alcoholic paralysis. ... Tubercle of the peritoneum or pleura frequently complicates cirrhosis of the liver. ... Alcohol in excess undermines the strongest constitutions and renders the body less resistant to diseases of all kinds. This is especially true when the individual leads a sedentary town life. Considerable amounts of alcohol may be taken without obvious deterioration of health by persons who lead an out-of-door life and eat heartily. ... Alcoholic subjects appear to be specially liable to acute miliary tuberculosis."

One of the most recent and definite pronouncements is that of Professor Thomas Oliver,[12] who says: "Nor is there any truth in the opinion held by the laity that the use of alcohol protects the individual against tuberculous disease. I do not refer to such a restrictive employment of alcohol as a glass of beer or stout or a little wine at dinner-time; that may be helpful to the individual. It is to the mistaken opinion that where there is a family predispositioned to the disease it is necessary to be somewhat more indulgent. In my experience of young men with a hereditary tendency to phthisis alcohol has, by the late hours which it encourages and the careless and irregular habits that it fosters, frequently precipitated the individual into active tuberculous disease, which abstinence and more careful living would have assuredly prevented. It indirectly favours the development of tuberculous disease." Pulmonary tuberculosis was found by Dickinson to be more frequent in drinkers than in ordinary people in the proportion of three to one. Dr. H. D. Rolleston, quoting Dr. H. Mackenzie, states that in 67 cases of pulmonary tuberculosis occurring in drinkers a family history of tubercle was only found in 10, whereas it is found in about 30 per cent. of the ordinary cases. The frequent association of pulmonary tuberculosis with alcoholic peripheral neuritis and its presence, too, in nearly one-third of the cases of cirrhosis of the liver are circumstances which show that under the debilitating influences of alcohol resistance is reduced, ordinary pulmonary catarrhs are not so quickly thrown off, and thus the bacillus of tubercle gains an easier entrance. Some have held that there is a tendency for phthisis in alcoholics to assume the fibroid form, but this is not in accordance with the best modern experience. Dr. G. V. Poore and Dr. W. H. Allchin in a recent article[13] speak of the association of tuberculous phthisis with alcoholic cirrhosis of the liver as "well established, the course of the disease being usually one of rapid caseation and excavation with broncho-pneumonia and rarely towards fibrosis." But the close association of tuberculosis and alcoholism has now been widely recognised not only by British physicians but also particularly by Americans and French observers.

Various suggestions have been made in explaining the liability of alcoholics to tuberculosis. There can be no doubt but that the non-hygienic surroundings and nutritional impairment and lowered vitality of the drunkard greatly predispose him to tuberculous invasion. But it is contended by some that even besides these factors there are special influences arising from the action of the alcohol and its associates. Professor Sims Woodhead has recently shown that alcohol has a marked influence in altering, or determining alteration of, the cells of animals subjected to the action of certain pathogenic organisms. Professor Abbott of Pennsylvania and also Dr. Deléarde working in the Institut Pasteur at Lille have recently shown that alcoholised animals

[3] On Consumption, its Nature, Symptoms, and Treatment, 1858.
[4] On the Treatment of Pulmonary Consumption, second edition, 1871.
[5] Austin Flint: Phthisis, 1875.
[6] THE LANCET, April 4th, 1885, p. 604.
[7] Dr. Arthur Ransome: The Treatment of Phthisis, 1896, p. 95.
[8] Clinical Lectures on Fever, Medical Times and Gazette, 1854, vol. xxx., p. 487.
[9] Medical Times and Gazette, vol. i., 1859, p. 587.
[10] Dr. Arthur Ransome: The Treatment of Phthisis, 1896, p. 94.
[11] Text-book of Medicine, edited by G. A. Gibson, 1901, vol. i., pp. 352-371.
[12] Ibid., p. 603.
[13] Diseases Determined by Poisons: a Manual of Medicine, edited by W. H. Allchin, London, 1900, vol. ii., p. 52.

are more readily infected by many organisms than non-alcoholised animals and other investigators have also shown that alcohol produces a marked negative chemiotaxis. It has also been found that animals brought into a state of chronic alcoholism are much less readily rendered experimentally immune to microbial infection. Attempts have also been made to show that alcohol through its influence on nervous structures renders the tissues and especially the lungs prone to invasion by tubercle.[14]

In order to compare some of our Manchester experience with the views and opinions above indicated I have endeavoured to analyse and to express the results of observation of hospital cases for a number of years. A reference to pathological data probably affords the most reliable basis for the formation of sound views as to the relationship of alcoholism and tuberculosis.

1. *Alcoholic neuritis and phthisis.*—Some time since I analysed a number of fatal cases of peripheral neuritis occurring in chronic alcoholics. Eight cases were subjected to pathological examination during a period of three years. They formed 1·6 per cent. of all the medical cases examined during that period. Pulmonary tuberculosis was met with in seven. This gives a percentage of over 87. All the cases were females. In only one subject were there distinct tuberculous lesions elsewhere than in the lungs, and then the intestines were also affected. In one subject there was an old tuberculous focus at the apex of the lung, but it seemed probable that the active phthisis was rather due to a fresh infection than from this latent patch. In five cases both lungs were more or less involved. In two the left was the only one showing any distinct tuberculous process. In three of the cases the course seemed to have been rapid. In four it seemed to have lasted for several months. One subject, it was stated, had "spat blood" six months before her death. In one case one lung only was studded with small tubercles, the injection having been recent. In two there was more or less extensive caseation. Four presented evidences of softening and cavitation, and in two of these there was some fibrosis. Since collecting the above[15] I have gone over my more recent pathological notes. Two further cases of alcoholic multiple neuritis have come to necropsy. In one, a male, aged 35 years, who was also the subject of hepatic cirrhosis, both lungs were studded with recent tubercles. There was no softening, but caseous foci at the apices were apparently of older formation than the tubercles elsewhere. In the other case, a female, aged 32 years, in whom there was also a fatty and cirrhotic liver, the lungs, although congested, œdematous, and presenting patches of broncho-pneumonia, showed no distinct evidences of tubercle. Thus, out of ten fatal cases of alcoholic neuritis, nine females and one male, eight, or 80 per cent., were the subjects of pulmonary tuberculosis.

In connexion with the recent remarkable outbreak of arsenical neuritis in Manchester and district, and occurring principally in alcoholics among the poorer classes, it is interesting to note that in a considerable number of the fatal cases active pulmonary tuberculosis was present and in some undoubtedly it had hastened the end.

2. *Tuberculosis is also of frequent occurrence in the subjects of alcoholic cirrhosis of the liver.*—In many cases it is manifestly of the nature of a terminal infection. In order to throw light on this matter the records of 3053 medical cases examined in the pathological department of the Manchester Royal Infirmary have been analysed. I have collected 121 examples of common cirrhosis of the liver. All doubtful and complicated cases were omitted. Cases associated with cardiac or such chronic affection as seemed to have led to secondary changes in the liver were excluded. All examples of "biliary" cirrhosis and those in any way connected with syphilis have been passed over. After omitting several doubtful cases, in 28 tuberculosis, either active, latent, or obsolete, was present. Thus, over 25 per cent. presented evidences of tuberculosis, active phthisis was present in 14 (12 males and two females), and active peritoneal tuberculosis in 12 (nine males and three females). Of these, six males and one female had involvement of both lungs and peritoneum. In five males and one female the lungs alone were affected, and in two males and two females the peritoneum alone. No less than 12, or nearly 10 per cent. of the 121 cases, appeared to die directly from tuberculosis. The average age of those in which active tuberculosis was limited to the peritoneum was nearly 47 years. The average age of those in which active tuberculosis was limited to the lungs was just over 44 years.[16]

[14] See Pulmonary Consumption, Pneumonia, and Allied Diseases of the Lungs, by Thos. J. Mays, New York, 1901, p. 61.

[15] Kelynack: On the Occurrence of Pulmonary Tuberculosis in the Subjects of Alcoholic Neuritis, Medical Chronicle, 1896-98, vol. iv., p. 180.

[16] See Kelynack: "On the Occurrence of Tuberculosis in the subjects of Common Hepatic Cirrhosis," Medical Chronicle, 1896-97, vol. vi., p. 262.

LEGISLATION SUGGESTED FOR CONTROLLING AND ERADICATING TUBERCULOSIS IN ANIMALS.[1]

BY PROFESSOR DUNCAN McEACHRAN.
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THE subject for discussion which I have the privilege of introducing must be carefully considered in all its various bearings, lest by proposing impracticable enactments we nullify our good intentions and give rise (as has already been the case in some countries and states) to bitter opposition by the owners of infected herds. Our efforts must be to educate the people so that they themselves will voluntarily adopt our suggestions, and, with the assistance of the State, to bring about a gradual diminution in the numbers of tuberculous animals in our herds, and the adoption by every stock-owner in the land of thorough preventive measures by which its re-introduction will be rendered impossible. The first step, therefore, which I would recommend is the publication and distribution among the masses—the agricultural population in particular—of information on the subject of tuberculosis. Much good work has already been done in this direction, but more must be done. If we look back for 35 years, when Villimin, Viseur, Chauveau, Gerlach, and others were engaged in demonstrating the contagious character and transmissibility of this disease, and compare our scanty knowledge then with the vast amount of information which, thanks to Koch, Bang, Nocard, and many others, we now possess, it will be easily understood why we who have been in the field of active work in the practical sense, as practitioners and advisers of our Governments, have in early days hesitated to advise active measures of control or eradication, and why the Governments have been slow to pass enactments bearing on the subject.

It was in 1882 that Koch first communicated the results of his investigations of the etiology of tuberculosis before the Physiological Society of Berlin, followed by further communications later. The knowledge of its transmissibility being due to a specific bacillus led to much investigation and experimentation. The reports and contributions to the literature of tuberculosis have for many years filled our journals and bookshelves to such an extent that no excuse is left for ignorance concerning the subject on the part of those interested in it. In citing evidence in support of any suggestions one may make as to legislation necessary to enable the people, assisted by the Governments, to control and subsequently to eradicate tuberculosis from the lower animals, we necessarily must consider the measures tried by those countries, especially in Europe and America, which have dealt with it. It is to be hoped that in the course of the discussion some new practical suggestions will be adduced which this Congress can recommend for adoption. Until Koch demonstrated that tuberculosis was due to the invasion of an organism, the tubercle bacillus, communicated either directly from an infected person or animal or by intermediate sources of infection, especially by buildings, pathologists were content to attribute its existence and extension to heredity; when, however, its real nature and its pronounced contagious character came to be known, both medical and veterinary practitioners stood aghast in contemplation of the thousand-and-one blunders which crowded their memories consequent on want of this knowledge. I remember well when, 30 years ago, I had temerity enough to read a paper based on the continental investigations referred to, before the Medico-Chirurgical Society of Montreal, in which I ventured to say: "The experiments of continental

[1] A paper communicated to the British Congress on Tuberculosis. Section IV., Veterinary Tuberculosis in Animals.

investigators have clearly established the close relationship between tuberculosis in men and in animals and the possibility of the disease being in many ways transmitted from the one to the other; and I am well aware that this disease is far more prevalent in the dairy herds supplying milk to the citizens of Montreal than is generally known, therefore I feel it my duty to invoke the aid of this society in endeavouring to bring about certain sanitary improvements in connexion with our meat- and milk-supply by the establishment of abattoirs under proper inspection, supervision of dairies, and inspection of milk." Such was the limited information on these matters at that date that of about 40 members present only one was in sympathy with the statements made. He was at the time a young man but recently graduated who has since made his mark in the world of medical science—I refer to Professor William Osler of Johns Hopkins Hospital, Baltimore. He alone would admit even the probability of contagion, or intercommunicability from animals to mankind or from mankind to animals—a doctrine which was to sweep away the long-cherished belief in heredity as a sole cause.

Pursuing this subject by close observation and numerous investigations of herds in Canada in which the disease existed instance after instance came to my knowledge of cases where the infecting animal was clearly traced to a diseased herd. Valuable herds were destroyed by tuberculosis and several owners were brought to the verge of ruin. At the period to which I refer shorthorn cattle (Bates and Booth families) had attained fabulous values, £5000 being a common price for a Duchess heifer, one cow being sold for nearly £9000 in the State of New York. Many of them were tuberculous. The frequent discovery by clinical examination of cattle imported from Britain passing through our quarantines, tuberculosis not being legally classified as a contagious disease at that time, obliged me to urge on the Government the necessity of amending the Animals Contagious Diseases Act so as to include tuberculosis in the list of contagious diseases. This was done in 1886, thus enabling us to put a stop to such dangerous animals being admitted to the country to the serious detriment of our home herds. Members of my own profession, and of the medical profession, did not hesitate to say that this act was premature owing to the etiology of the disease being not then sufficiently understood. Were proofs wanting of its contagiousness, I could furnish sufficient to convince the most sceptical, but I should be wasting your time by their recital. I must, however, crave your indulgence for a few minutes while I make some general allusions to this characteristic of the disease.

The infection of healthy animals we know takes place readily from cohabitation, the bacilli gaining entrance by the respiratory organs in most cases but by the digestive tract in many, especially in calves when suckled by diseased mothers, and calves, pigs, and other animals fed on milk or on dairy by-products containing living bacilli—in pigs when allowed to eat tuberculous matter found in carcasses and slaughter-house refuse given them as food; probably, too, in rare instances, from eating the flesh of tuberculous animals. It is to the buildings themselves, however, that we must look for the chief source of infection, and to neglect of disinfection and sanitation must we attribute in a great measure the continuance of the disease and re-infections with which we are familiar. I could cite repeated instances of herds cleared out and new purchases made, with every care in purchasing, being followed by new cases of tuberculosis; so that I feel that too much trouble cannot be taken by practitioners who are employed to eradicate this disease to make sure that the buildings are aseptic and that sufficient air-space is provided as well as a rational system of ventilation, whereby pure air is admitted and foul air driven out, also that properly trapped drains carry off the liquid excrements and prevent the return of noxious vapours. The importance of pure air and sunshine cannot be overstated in considering the prevention of tuberculosis. It is, however, a mistake to suppose that infection will not take place when diseased and healthy cattle are brought together, even when these conditions exist in the very highest degree. I have seen tuberculosis prevalent in ranche cattle, few of which were ever under a roof, ranging on the foothills of the Rocky Mountains in Montana. I have known a valuable herd of Polled Angus which were brought into the Peace River country in the far North-west of Canada which proved to be tuberculous and was ultimately exterminated in consequence. In these and other instances which might be referred to pure air and sunshine certainly prevailed, yet these did not prevent infection from taking place when the animals were congregated in corrals, bunched together during fly-time, or placed in infected sheds in winter.

Heredity.—To eliminate heredity entirely from the causative faculty would be an error; but we are safe in saying that it plays a very unimportant part in its extension. The rarity of the disease being found in calves at birth in all countries has been noticed by Professor Bang, Professor Siedamgrotzky, and others, and the immense success attending the rearing of calves from tuberculous cows by Professor Bang's system in Denmark and other countries, including Canada, proves conclusively that it is not hereditary in the same sense as gout or insanity are known to be transmitted from parent to progeny. When visiting Professor Bang at Copenhagen three years ago he showed me two newly-born calves sent in by an inspector; in the livers of both tubercles were found. Uterine tuberculosis when seen is generally associated with generalised miliary tuberculosis, especially when it is peritoneal. The rarity of tuberculosis in the male genital organs precludes the probability of infection by copulation, except in very rare instances; hence we infer that when the newly-born calf is found tuberculous infection has probably taken place within a diseased uterus. By far the most numerous infections have occurred after birth. Professor Bang says: "I had occasion to observe more than 400 cases of tuberculosis either in fœtuses or newly-born calves; nevertheless, the number of congenital tuberculosis has scarcely gone beyond 0·33 per cent. of the killed calves even in the most infected regions." While intra-uterine infection from a diseased mother is occasionally seen congenital tuberculosis plays a very unimportant part in the continuance and extension of the disease compared with the many ways in which the essential factor in its production—viz., the tubercle bacillus—gains an entrance to the animal body; in other words tuberculosis is a contagious disease, not a hereditary one as was supposed.

The diagnosis of tuberculosis.—The clinical diagnosis of tuberculosis, even by the most expert clinical examiner, except in advanced cases, is always unreliable, as tubercle may exist in such a stage as would be impossible of diagnosis by this means.

The tuberculin test.—The discovery by Koch, in 1890, of the production of fever, indicated by a rise in temperature in tuberculous animals into which he injected a sterilised glycerine extract of pure cultures of tubercle bacilli, while it produced no effect whatever when the animals were free from that disease, furnished us with a simple but very reliable diagnostic agent. The effects produced by this discovery on the commercial aspect of the business of the dairyman and cattle-breeder have been in many instances most disastrous. Herds which were supposed to be free from disease were discovered by this test to be tuberculous; dairy businesses have been ruined—justly so we must admit, for no man has a right to sell milk or dairy products manufactured from them when derived from diseased cows any more than a breeder of pure-bred stock has to sell animals suffering from a contagious disease from which recovery is the exception. The exposure by this means of the prevalence of the disease, especially in dairy cattle, naturally aroused anxiety in the minds of the guardians of public health; a furore was thus created and the public mind was greatly disturbed when, in addition to this, its intercommunicability to human beings was made known. Hence we find many dairymen and cattlemen in all countries denouncing tuberculin and protesting against its use; not all dairymen, nor all breeders, however, joined in the denunciation of what is well known to be a safe, harmless, but reliable means of detecting this disease, even in its most incipient stages. In Canada during the past year, from Nov. 1st to Nov. 1st, there were 17,785 head of dairy cattle tested officially by voluntary application of the owners, on condition that the entire herd should be tested and all reacting animals quarantined for life, without compensation. Of this number only 358 reacted, or about 2 per cent. What opposition we met with came from breeders who had suspicious herds or herds which by private testing were known to be diseased; it came chiefly from men who combined importing for speculative purposes with breeding. In some of these cases the importers, we have reason to believe, were not ignorant of the cattle being tuberculous; in others we fear the man who paid the money was a victim of imposition or gross neglect of his interests on the part of his agent.

I will cite one instance of each case which came under my personal notice. (a) A herd of 13 cattle arrived at

Point Levis quarantine—two of them showing clinical symptoms of the disease; examination of the chart which accompanied them showed that it was not genuine. It was therefore decided to test them, to which the person who had imported them objected, and while correspondence was going on one cow died from acute generalised tuberculosis; of the rest all reacted but one, and on post-mortem examination all were found to be tuberculous. (*b*) A gentleman of large means decided to import a herd of useful but not high-priced shorthorns. He sent an agent to purchase and to import them. This agent was instructed to use every precaution by testing and otherwise to secure animals free from tuberculosis. They were bought in Ireland without being tested; they were brought to Scotland and there tested; two were rejected, the balance were shipped to Canada with a chart which was not quite satisfactory, and on testing them, by request of the owner, five out of 13 reacted.

Personally I believe with Professor Nocard that tuberculin does not lie; how is it, then, that so many tuberculous cattle come to us in America accompanied by charts and certificates of health? If the importer is a party to fraud, then he should be severely dealt with; if he is negligent, then he should pay the penalty of his negligence, for he has no right to import animals suffering from a contagious disease. Is it possible that agents or middlemen deal in suspected cattle—which are bought knowingly by the one class of importer or foisted on to the other? Is the professional man employed to test for export imposed on by previous tuberculination nullifying or at least rendering uncertain his honestly applied test? Are all such men above suspicion? My own experience in a few instances in Canada compels me to say no. Or is it the tuberculin that is at fault? When we meet with reactions varying from 40 to 90 per cent. in cattle certified as healthy, as is found in both Canadian and United States importations, such questions force themselves on us and are sufficient explanation of why both Governments have each decided to keep a professional man in Britain on whose charts alone will cattle be allowed to pass through our quarantines without re-testing.

Reaction.—We are often asked by importers and testers in Britain what reaction we consider indicates tuberculosis. Experience has taught us that it is not the extent of the rise in temperature so much as its character taken in conjunction with attendant circumstances. Ordinarily a rise of 2° F. above the highest normal is due to tubercle being present; but the single occurrence during the day of such a rise may be due to some accidental circumstance. A typical reaction is arched, the maximum temperature occurring at the seventeenth hour, falling to normal about the twenty-fourth hour or sooner in many cases. The character of the reaction may be altered by copious draughts of cold water, or a lowering of the body temperature from any cause; so, also, does the raising of the body heat from such causes as flies, atmospheric heat, and scarcity of water, all of which produce variations in the reactions. In addition to which might be mentioned applying the test when the animal is excited from any cause, such as driving cows from the field to the stable, railroad journeys, steamboat conveyance, change of climate, change of byre, bulling, stage of the disease (in advanced cases often no reaction follows), and, what to us is most important, the uncertainty of reaction for months after injection of tuberculin. As I said above, tuberculin can be almost absolutely relied upon if properly used, there is no other diagnostic agent to be compared with it, yet it is capable of much abuse, and is often improperly used.

Objections urged against the tuberculin test.—In my opinion there is not one tenable argument used by cattle owners or importers against its use. I have never known a single instance of a person owning a healthy herd to lift up his voice against it, but I could multiply instances of men becoming almost maniacal in their denunciation of the test since it has been required in the international live-stock trade between the United States and Canada, as well as importations from Europe—men whose herds when tested reacted sufficiently to warrant one in suspecting previous knowledge from private testing on their part. With a view to get at the truth of some of their objections I sent a circular-letter to inspectors throughout Canada, in which I asked replies to the following questions, suggested by newspaper discussions on the subject: 1. "Do you know of any cases in which the use of tuberculin as a test has produced abortion? 2. Do you know of any instance in which a bull has been rendered impotent by the use of tuberculin? 3. Do you know of any case in which the general health of the animals has been injured by the tuberculin test? 4. How many cattle have you tested during the past year? 5. How many post-mortem examinations have you witnessed of animals condemned in consequence of having reacted to the test? 6. In how many instances did you fail to find tubercle?" The replies are all negative to the first three questions; to the fourth they aggregate 22,023 head; to the fifth 579, and to the sixth 10, and one doubtful. Professor Leonard Pearson, State Veterinarian for Pennsylvania, states, in his report for 1899, that "of 4400 post-mortem examinations made tuberculosis was found in all but eight animals that had reacted."

I also sent similar questions to a few of the farmers who had had most experience with tuberculin. The following replies will represent the others:—(*a*) In answer to the first question, "Do you think that the test injures cattle in any way?" he says, "No; I do not think there is the least injury in the tuberculin test. Our herd of over 50 head have been tested three years in succession, and I fail to notice any injurious effects whatever from the test." In answer to the second question, "Have you ever had any bad results that you could attribute to the use of tuberculin?" he says, "None. I am using a bull that has been tested five years in succession, and is seven years old, and a more active, healthy animal I never saw—a very sure animal, you may judge, by our dairy of 42 cows; there is only one farrow. As to abortion, we do not have near the trouble that we had before we commenced testing, for I consider that we have a healthy herd now. Previous to the testing of our dairy we had very serious trouble with abortion." (*b*) "1. I do not know of any case wherein the use of tuberculin has produced abortion, and on our farms we have tested cows at all stages up to within a very short time of calving. 2. I have never known of a case wherein a bull was rendered impotent or injured in any degree whatever by the use of the tuberculin test. 3. I have not known of a single case wherein the application of the tuberculin test affected prejudicially in the slightest degree the general health of animals tested therewith. 4. We have had between 300 and 400 cattle tested. 5. I have not personally witnessed any post-mortem examination, but I have had reports from the veterinary surgeon who does our work on every animal which was condemned as a result of the test, and in almost every one positive traces of the disease were found."

From these facts we deduce the following:—1. Tuberculosis is essentially a contagious disease and ought to be so classified and acknowledged by every country and state in the world as such. 2. It is insidious in its character and in only a few cases comparatively can it be diagnosed by physical examination, but in tuberculin we have a safe and reliable test by which even latent cases can be diagnosed. 3. That tuberculin is harmless. It does not produce abortion in pregnant cows, impotency in bulls, or in any way produce any injurious effects on animals tested by it.

Methods adopted by different countries.—Some years ago in Massachusetts compulsory testing was tried, but was found to be impracticable and met with strong opposition. Belgium adopted somewhat similar methods with similar results. It had to be given up and at present the killing is restricted to animals in which the diagnosis can be made by clinical examination. In Switzerland free testing is practised. All clinically diseased animals are slaughtered; reacting animals are marked by cutting out a triangular portion of the ear. In France there is immediate slaughter of clinically diseased animals and slaughter within one year of reacting ones. In Germany tuberculin is furnished free and monetary aid is given to those who adopt the Danish system and otherwise resort to prophylactic measures for its eradication. In most of the German States it is required to sterilise the creamery and dairy products and their by-products, skim and butter-milk. In Denmark free testing is done on voluntary application. Clinically diseased animals are killed; the others are divided into healthy and reacting. These are separated in different buildings or partitions are used to divide the byres; in one section the healthy, in the other the diseased, are placed. The reacting ones are bred from; the calves are reared on milk from healthy cows or pasteurised milk, or milk which has been heated sufficiently to kill the tubercle bacilli. The success of this plan has been fully demonstrated by Professor Bang. In America—both the United States and Canada—for a number of years all cattle imported from Europe were tested in the quarantines. A few years ago importers urged that the practice too often led them into serious losses—the value of the diseased animals as well as freight and other expenses incurred—and discouraged, as a consequence, importation generally; and to meet the views

of importers the Canadian Minister of Agriculture ordered that a number of veterinarians throughout Britain should be selected whose charts of test would be accepted without testing again in Canadian quarantines. This plan worked very badly, as numbers of diseased cattle were imported, several valuable herds being found clinically diseased, and were slaughtered. The United States had similar experiences with British charts of testing. This is regrettable, as both countries acknowledge the great results obtained by British breeders in producing excellent cattle, knowing as they do that on no spot on earth can cattle of equal merit be produced. There is something in the soil and the air of the sea-girt isle so favourable to the production of high-class bovines that breeders abroad must come to Britain for fresh blood to keep up their herds, otherwise marked degeneration is soon apparent. For this reason each country, rather than prohibit importation altogether, has appointed a veterinarian to do the testing, and on their charts alone cattle are admitted to both countries without being tested in quarantine. In Canada testing is done at Government expense, when voluntary application is made for testing the whole herd, and reacting animals are quarantined for life. Professor Bang's system is coming much into practice in Canada. In a few herds it has been successful in a remarkable degree. No compulsory measures have been tried. Tuberculosis exists in Canada to a limited extent only. No statistics for the entire Dominion are available, but the following figures indicate this. Testing has so far been confined almost entirely to dairy herds, and was employed in most of these owing to suspicion or knowledge of infection.

Year.	Tested.	Reacted.
1897-98	6,516	412
1898-99	16,882	451
1899-1900	17,785	358

The following regulations are enforced between the United States and Canada:—

Breeding stock.—Section 21: All cattle to be admitted for breeding purposes shall be accompanied by: (*a*) a declaration made by the importer that they are actually for breeding and no other purposes; (*b*) a certificate signed by a Government veterinarian specially selected and appointed for this duty, that they have been subjected to the tuberculin test and found free from tuberculosis. Such certificates must show the date of testing and chart of reaction with a description of the animal giving age and markings. The importer may be required to swear that the certificate refers to the animal represented. (*c*) A certificate of inspection signed by a Government veterinarian showing that the animals are free from contagious disease, and that no contagious disease of cattle (excepting tuberculosis and actinomycosis) exists in the district whence they came. (*d*) When not accompanied by such certificates the animal or animals must be detained in quarantine for one week and subjected to the tuberculin test. (*e*) Should they be found tuberculous they must be returned to the country from which they were shipped or slaughtered without compensation.

Fat cattle and cattle for feeding, including range cattle for stocking ranches.—Section 22: This class of animals shall be accompanied by a certificate of inspection signed by an official veterinarian showing that the animals are free from contagious disease and that no contagious disease of cattle (excepting tuberculosis and actinomycosis) exists in the district whence they came.

Settlers' cattle.—Section 23: Settlers' cattle when accompanied by certificates of health to be admitted without detention; when not so accompanied they must be inspected. Inspectors may subject any cattle showing symptoms of tuberculosis to the tuberculin test before allowing them to enter. Section 24: Any cattle found tuberculous to be returned to the United States or killed without indemnity. The following extracts from copies of the laws and regulations governing the control and for the eradication of tuberculosis in individual States furnished to me by the authorities may be cited with advantage and can be found more in detail in a bulletin recently issued by Dr. Salmon, Chief of the Bureau of Animal Industry at Washington.

State legislation with reference to bovine tuberculosis.—Illinois.—Legislation under Board of Live Stock Commissioners. Their rules and regulations are as follows. All cases are reported to the Board. When physical condition indicates tuberculosis the animals are quarantined till tested under direction of the Board. A rise of two degrees or more (if in the opinion of the veterinarian in charge it is due to tuberculin) constitutes reaction and such animals must be isolated and held in quarantine till they are slaughtered and examined post mortem. A rise of 1·5°F. and less than two degrees is suspicious, and the animals must be isolated and quarantined for re-test. The maximum indemnity is not to exceed $75. The following is the classification for compensation. Class A.—No lesions: full appraisal. Class B.—Incipient disease: 75 per cent. of appraised value. Class C.—Infected for one year: 50 per cent. of appraised value. Class D.—Infected for two years: 35 per cent. of appraised value. Class E.—Infected for three years: 25 per cent. of appraised value. Class F.—Infected more than three years: 15 per cent. of appraised value. Should the proceeds of the carcass exceed the percentage valuation, the owner receives the full amount. "Definite legislation needed with money to carry out provisions. Time not ripe for drastic measures."

Iowa.—No special legislation. Tuberculin is used where necessity and public safety demand. Reacting animals are tagged and quarantined, provision being made that they may be shipped to any abattoir in the State for slaughter, subject to inspection by bureau inspector, State veterinarian, or one of his assistants. No remuneration save what the animal will bring as a fertiliser. Thirty per cent. of the reacting animals are condemned on post-mortem examination. Work that is done is done thoroughly, but more is needed.

Kansas.—No specific law. Animals must be tested on entering the State, but may be brought in for show purposes without test, but if sold, they must be tested before they are allowed to stay in the State. At the present time there is litigation as to the legality of the rules and regulations.

Kentucky.—No special legislation. Animals may be dealt with by the State Board of Health. Animals cannot be condemned until examined by competent veterinarian. Indemnity is not provided.

Maine.—Commission of three persons appointed by the Governor. Necessary quarantine is enforced, half compensation being given for animals destroyed providing they have been in the State for a year or more. Compensation not to exceed $100 for pedigreed, or $50 for grade stock. Appraisal not being accepted by owner, rigid quarantine is enforced. The tuberculin test is not officially designated. The regulations are sufficient, but there are not enough funds for enforcing them properly.

Massachusetts.—General laws on contagious diseases cover tuberculosis. Compensation to the full value, not to exceed $40·00 in any case. Tuberculin is restricted to cattle brought in from without the State, excepting upon written request of the owner and on such animals as are condemned as being tuberculous by a competent veterinary surgeon. No compensation is granted unless the rules regarding disinfection, cleanliness, ventilation, light, and water-supply are complied with as directed by the commission. Owners using tuberculin are not entitled to indemnity for animals which react, unless the testing is done by the Board of Cattle Commissioners or by its direction. The regulations work well and good work is done, but more money could be spent to advantage.

Michigan.—General law on contagious diseases; no special law on tuberculosis. The State veterinarian is acting under the general law against tuberculosis. On complaint of local board of health or individuals suspected cases of tuberculosis are tested. Reacting animals are destroyed or rigidly quarantined. There is no provision against entrance of tuberculous cattle. The Governor has power to prevent, but the commissioner has not seen fit to protect the State.

Minnesota.—General legislation applies empowering local or State board of health to act. Two tuberculin tests are required to condemn a tuberculous animal and must be given within three months and in not less than two months. There is no further legislation. Experience shows the inefficiency of procedure now in vogue.

Montana.—Towns of 5000 or over to have a meat and milk inspector who must be a graduate of a reputable veterinary medical college. All animals supplying milk to the public must have a certificate of tuberculin test and be inspected every month. The laws have just passed, and it is thought that they will prove sufficient if carried out to the letter. There is not much tuberculosis in the State—only about 5 per cent.

New Hampshire.—General law relates to tuberculosis. Co-operation is general with the Federal bureau. The indemnity is the full appraised value, to be paid by the towns, which are reimbursed four-fifths by the State. Such animals must

have been owned within the State three months before the detection of the disease. Cattle entering the State must be tested under the authority of the Board of Commissioners. Pasturage permits granted on physical examination by competent veterinarian—a graduate of a recognised school. Massachusetts cattle, tagged by the Massachusetts Cattle Commission, are allowed to go to New Hampshire for pasturing and to return to Massachusetts without test. Upon a request by cattle-owner he may have his herd officially inspected by the Board. If the inspector deems it necessary tuberculin is used, and the owner must conform to measures prescribed by the Board. The test applied is at the State's expense, and half value is given for all animals reacting. Precautionary measures to stamp out disease are at owner's expense. Experience shows that enforcement of sanitary measures is as important as the destruction of diseased animals. Ventilation, light, exercise of animals, and disinfection are regarded as the most important part of the work. Progress is being made in suppression and radical measures are not needed.

New Jersey.—Commission of seven, composed of the president and the secretary of the Board of Agriculture and five others appointed by the president, examine herds on request, but the tuberculin test is optional with the commission. Condemned animals are appraised at market value and three-fourths are paid to owner. All cattle from without the State are tested. The disease is gradually lessening in prevalence by the education of farmers as to its character, and the need of greater care in breeding, stabling, sunlight, and ventilation.

State of New York.—Tuberculin applied upon written request under conditions prescribed by the Commissioner of Agriculture. The commissioner may order the test, holding a reacting animal in strict quarantine. He may condemn, quarantine, or slaughter when tuberculosis is found on physical examination. Compensation shall not exceed $60.00 for thoroughbred and $40.00 for grade providing the animal is not found to be diseased at the post-mortem examination. If the animal is affected with the disease for which it was killed or other dangerously contagious or infectious disease no compensation is allowed. Animals entering the State which pass the Federal authorities are allowed to proceed.

North Dakota.—Tuberculosis is under general legislation, the State and district veterinarians dealing with the subject. Cattle from without the State must have a certificate of health or be examined by State official. Tuberculin test is not specified.

Pennsylvania.—All animals entering the State must be tested with tuberculin. Other testing is left to the discretion of the Board. Compensation is not more than $25.00 for infected grade and $50.00 for infected registered stock. Measures for combating this disease as well as others are at the discretion of the Board and are not flexible.

Rhode Island.—Appraisal for "scrub" animal $50.00, grade $75.00, and registered $100.00. In event of an animal being found infected at necropsy the State pays half the value, but if healthy the full value. The animal must be owned within the State at least three months previously. Cattle coming into the State must be tested with tuberculin.

Utah.—Cattle having tuberculosis shall not be kept by dairymen and shall be killed by the Dairy and Food Commissioners. There is no provision for the tuberculin test or for indemnity.

Vermont.—Tuberculin test is applied without expense on application and the whole herd must be tested. Such herds cannot admit new animals unless they undergo the test. Reacting animals must be killed and buried or burned at the expense of the owners, who retain the hides. The Board regulates a right to re-test when considered necessary. The rules of the Board where herds are tested regarding disinfection must be observed. Cattle entering the State from without must be tested by a person approved by the Board and the expense is borne by the owner. Animals killed by written order of the Board are appraised, such appraisal not to exceed $40.00. A necropsy is held, and if tuberculosis or other disease dangerous to public health is found, owner receives half the appraised value. Such animal shall have been in the State six months previously to discovery of disease. Experience shows that if the rules for disinfection are followed the disease is stamped out. Persuasion is used by the Board to induce testing of the suspected herd. These measures are radical enough at present, for the public must be considered and be in sympathy with the movement rather than antagonistic.

Virginia.—Tuberculosis is classed as a highly contagious and infectious disease. The Board of Control of Agricultural College has power to enforce such measures for its control as are deemed necessary.

Educate the People.—Educate the people by furnishing them with the most important scientific and practical facts which are known about the disease. Much good has been done in Canada by the distribution broadcast of bulletins from which the following items are extracted:—

Tuberculosis.—This disease claims for its victims nearly, perhaps we might say, all the domestic animals, and few of the wild animals subjected to domestication resist the contagion, as is well known to keepers of menageries. Rats, mice, and other vermin which inhabit houses and outbuildings not only contract the disease but are active agents in spreading it. Some species are more susceptible than others, and contract it readily by eating food containing the germ of the disease, or by inhaling the dried germs given off from the lungs, throat, uterus, or intestines of animals affected in these organs. The most susceptible of the domestic animals are cattle, swine, chickens, goats, and rabbits. These contract it readily in the natural way, but it can be produced in sheep, dogs, cats, and horses by inoculation with tuberculous material. Tuberculosis in the lower animals is the analogue of consumption in the human family. It is due to a similar germ (bacillus tuberculosis bovis); it is, however, more virulent than the human bacillus. It is communicable from other animals to man, and from man to the lower animals, by natural infection and inoculation.

Tubercle.—The germs (bacilli), which are living organisms of minute microscopic size, when they reach and become located in a tissue, produce local irritation and the formation of small reddened areas infiltrated with fluid and cells. These are the tubercles. As they become older they enlarge, and their colour is greyish or yellow from changes that take place within, causing the death of the central tissues. Their appearance and consistence in this way resemble that of cheese. These nodules may vary in size from a pinhead to a cocoanut, often they are of stony hardness from the presence of lime salts. The tubercles, for example, may be confined to one organ or tissue of the body, such as the lymphatic glands of the mesentery or thorax, or the throat, udder, ovaries, &c., or they may be generalised throughout the body, the germs travelling in the blood circulation. In this way the abdominal organs (the liver, spleen, kidneys, &c.) may all be involved as well as those of the thorax, lungs, pleura, lymph glands, &c. Often the pleura and peritoneum are covered with grape-like excrescences the appearances of which are characteristic of this disease. Wherever tubercles are lodged for any length of time much destruction occurs in the affected tissue.

The tubercle bacillus.—This is described as a rod-shaped organism with rounded ends and a slight curve, requiring complex laboratory methods of cultivation and staining to prepare it for microscopic study. It is a parasitic organism which is only found in the bodies and excretions of animals affected by this disease. It thrives badly in the sunlight, which is said to kill it in from a few minutes to several hours. This fact should be remembered in dealing with it with a view to preventing tuberculosis. The invasion of the animal's body by the entrance into it of living bacilli is effected either through the digestive organs (ingestion) or by the respiratory organs (inhalation), by transmission to the sexual organs when the testicle is invaded and by inoculation, or by a cut or abraded surface. Without the entrance of the living bacillus into the body tuberculosis cannot affect it. It is the seed from which it grows, and it is as essential to the development of the disease as oats, peas, or potatoes are to reproduce these plants.

What renders cattle susceptible to this disease?—Impaired health, from whatever cause it arises, renders cattle susceptible to tuberculosis. Heredity has been proved not to be an active cause of its propagation. It is well established by the experiments of Professor Bang and others that calves may be bred from tuberculous mothers, and if removed before the cow licks them or they have sucked their mother's milk, placed in absolutely healthy surroundings and fed on milk from healthy cows, they can be reared and remain, so far as any inherited disease is concerned, perfectly free. In-and-in breeding by producing animals with reduced vitality, overmilking, under-feeding, want of sunlight, pure air, or sufficient exercise, breeding too young, are all what may be termed predisposing causes to tuberculosis and should be avoided. One breed of cattle is just as liable to contract

this disease as another when subjected to the predisposing and exciting causes. Dairy cattle are most subject to it because they are more exposed—they are more congregated, more closely and continuously housed, their vitality is more drained by heavy milking, and they are kept longer than the beef breeds. Their calves are more liable to milk infection, as they are fed on mixed milk, whereas the beef breeds usually suckle their calves. The majority of beef cattle are killed off at three or four years old, hence they are exposed to the contagion for a shorter term of life, which is spent more in the open air and in sunlight.

How the disease is usually introduced into a herd and how it extends in it.—A tuberculous bull is probably the most active agent in spreading this disease, both by cohabitation and by sexual connexion. Farmers cannot be over-cautious in buying a bull or in having cows served by one till he has been subjected to the tuberculin test and found free from the disease. Nothing should induce a breeder to allow contact with his healthy cattle by a bull till he has every assurance that he is free from tuberculosis. Tuberculous animals of any kind should be prevented from coming in contact with the cattle.

Tuberculous attendants.—Tuberculous attendants—men or women suffering from pulmonary consumption—should on no account be allowed to feed, milk, or have anything to do with cattle or pigs. The intercommunicability of the disease from animals to man, and from man to animals, is an established fact and is no longer open to discussion. The bacilli from the throat and lungs of diseased people or animals, being coughed up, adhere to and dry on the woodwork, walls, floors, and feed-boxes in buildings, cattle-trucks, or stock-yards, and the dust being moved about by air-currents, being inhaled, infects the respiratory organs, gains access to the blood-stream or lymphatic glands, or mixing with the food in the hay-rack or feed-trough, finds access to the stomach and intestines, and thence through the blood or lymph channels to the abdominal glands and other organs.

Danger from milk.—The virulence of milk from tuberculous cattle, especially when the udder is diseased, has been clearly demonstrated. It will communicate the disease even when the milk is diluted by mixing with large quantities of other milk in the creamery or cheese factory; whey is equally dangerous. Milk from cows in advanced stages of generalised tuberculosis is also dangerous, but milk from cows in early stages of localised tuberculosis may not prove infective to calves or persons fed on it. It should, however, be sterilised by heat before being used. The germs remain active in skim-milk and whey and may produce the disease in calves fed on it. Milk obtained from creameries in districts where tuberculosis prevails should be raised in temperature for 10 minutes to 180° F. before being given to calves, otherwise living bacilli may be taken into the stomach, and, entering the lymph channels, produce the disease. As a precautionary measure, milk from tuberculous cows should not be received at creameries or cheese factories. Unless this is done creameries and cheese factories may become distributing agents of the disease to healthy herds. Milk from tuberculous cows is a frequent source of communication of the disease from cattle to people, especially children and old, feeble persons.

How to prevent its introduction to a herd.—See that your animals to begin with are free from the disease. Never bring any animal into the byre till you have ascertained beyond a doubt that it is healthy. Keep your own bull. Your neighbour may be obliging, but if he is careless about the health of his stock you may suffer irreparable injury by accepting even the free use of his bull should the animal happen to be tuberculous. Conversely, if you have a bull, be exceedingly careful to see that no tuberculous cows are brought to him for service. Never allow a consumptive person to have anything to do with your cattle; make no mistake about this. Your byres must be well lighted—almost as light as outdoors; disease germs are killed by sunlight. Pure air and plenty of it is essential to health. This can only be provided by sufficient space. Let your cow stable be roomy. Drainage is essential to the purity of the air. Without proper and efficient drainage the air must become contaminated by the emanations from the droppings and urine of the cattle as well as by the decomposing vegetable matters with which they are mixed. Drain your buildings, and do it thoroughly. The ventilation is all-important. By properly arranged ventilators the impure air is removed and replaced by pure air. The oxygen of the air is constantly being consumed in the process of breathing and unless it is replaced it becomes unfit to sustain animal life. The constant change of the air in buildings inhabited by animals is absolutely necessary to preserve health. During summer weather most buildings are sufficiently ventilated by the doors and windows being left open; it is during the winter, when cattle are housed, that they suffer from imperfect ventilation. Proper ventilation provides for the admission of the pure and the escape of the foul air. As a rule, farmers' architects do not make sufficient provision for either. The air may be admitted by openings near the floor and by windows hinged at the bottom and dropping inward. The ventilators or air-shafts are usually too small. Most buildings require shafts three feet square, placed about 20 feet apart, in the middle aisle of the byre. The shafts should be divided inside into two by a partition extending from the top to within three feet of the ceiling, the opening being controlled by trap-doors opened or closed by cords running through pulleys.

Cattle standing head-to-head objectionable.—The common plan of arranging the byre, so as to save labour in feeding, by having an alleyway with the heads of the cattle opposite each other, is objectionable from a health standpoint, as it exposes animals opposite to tuberculous cattle much more to the contagion than when they are placed with their heads to the wall. They may be easier fed the former way, but they are easier cleaned the latter, and it has a decided sanitary advantage should contagious disease exist. Running water in troughs placed in front of the cattle is objectionable if tuberculosis is present, as by this means the germs may be carried to the whole herd.

Symptoms and diagnosis of tuberculosis.—In the majority of cases the symptoms are obscure, and till the discovery by Professor Koch of the reaction produced by the injection of tuberculin (being a most reliable test for discovering this disease in obscure cases unrecognisable by symptoms), the majority of cases could not be detected even by experts. When affecting the lungs, throat, and respiratory organs generally it is accompanied by a frequent cough but no fever. There is disturbance of respiration, the breathing is quickened by slight exertion or excitement, and the cough is produced by changes of temperature. The expert can detect dull spots surrounded by areas of increased resonance on examination of the lungs by the usual methods. Usually the superficial glands in the throat, between the jaws, or under the ear or the udder may be hard and swollen. The animals may continue for months or even years to maintain fair condition; they are sometimes fat while the lungs may be found studded by large tuberculous masses. When the disease is abdominal and the glands and organs in the belly are chiefly affected, the symptoms of defective nutrition are early apparent—emaciation, lessened secretion of milk, indigestion, breathlessness, and general failure more or less rapid. Many cases cannot be detected by symptoms, but can be revealed almost to a certainty by the tuberculin test.

The tuberculin test.—Until the discovery by Professor Koch in his experiments to find a cure for consumption in human beings that the injection of tuberculin invariably caused a rise in temperature when the person or animal was tuberculous, while it produced no effect whatever when free from it, the detection of the disease in early stages or when slightly affected was considered impossible in most cases. This test is most delicate and reliable (about 98 per cent.) where it is properly applied. Tuberculin is a soluble product of cultures of tubercle bacilli, of which a glycerine extract is made, which is sterilised by heat and filtered through porcelain, so that it contains no living germs and therefore cannot produce tuberculosis in animals injected with it. It has therefore no effect on healthy animals; in some cases the disease is aggravated by it when it exists, but it cannot be produced by it.[2] The lymph must not be exposed to sunlight, it must not be frozen, and it must be kept well corked to exclude air. Tuberculin injection has no bad effects on the secretion of milk. The consensus of opinion of those most experienced is that it does not lessen the secretion of milk in dairy cattle, consequently these may be tested even when they are in full milk without disturbing its secretion unless it be during the few hours of its absorption. It has never been known to cause abortion in cows or sterility in bulls, as has been claimed by its opponents; in fact some breeders state that it lessens abortion. The consensus of unprejudiced opinion is that

[2] It would be as reasonable to expect barley to grow from whisky placed in the ground as tubercle from injecting tuberculin into an animal body.

it is harmless to cattle, even when tubercle is present, and in some cases it exercises curative influence. Dose.—The dose varies with the size and age. As issued by the Department of Agriculture it is ready for use, with doses marked on the bottle—viz., 20 drops for calves, 40 drops for small or medium-sized animals, 60 drops for larger, and 80 drops for very large ones. When second tests are considered necessary at least 90 days should elapse and the doses should be slightly increased. Second tests are quite unreliable and often deceptive.

How to deal with a diseased herd.—When tuberculosis is discovered in a herd immediately remove the diseased animals from the healthy to an isolated stable, or a part of the byre may be partitioned off by close boards as far as possible from the rest of the herd. In the case of low-priced cattle the owner will best serve his own interests by slaughtering them at once. When they are especially valuable and in calf, the experiments of Professor Bang and others show that the calf may be saved by removing it as soon as born and before the cow has licked it or it has been suckled by its diseased mother, and by placing it in an uninfected building and feeding it on milk from tested cows, it will in all probability grow up free from tuberculosis. The herd should be tested every six months and those animals which react should likewise be removed till all symptoms have disappeared.

Disinfection of premises.—Most careful and complete disinfection of buildings and yards in which diseased cattle have been kept should be employed to rid them of disease germs. In doing this, before sweeping, sprinkle the floors and walls thoroughly with water to prevent dust rising, removing drinking-troughs, feed-boxes, and stall divisions. The floors must be specially scrubbed, the walls, ceilings, and partitions should be carefully washed, and all freely sprayed with a disinfectant solution such as carbolic acid (one pint of crude acid to four gallons of water) or lime-wash. It may be applied by a whitewash brush or by a spraying pump, care being taken to see that every corner, crack, and joint is thoroughly penetrated by it. The cleansing and disinfection should extend to drinking troughs and fences of the barnyard to make disinfection complete.

Disposal of tuberculous carcasses.—Should the disease be local, as is frequently the case, being confined to one or more glands, the flesh can be used as food with impunity. Infection from flesh is an extremely rare occurrence, and most unlikely to occur if it has been thoroughly cooked. This can be most relied on when it is cooked in the minced form; deep-seated portions of large roasts may not be exposed to sufficient heat to kill the bacilli. When on post-mortem examination the disease is found to be generalised the carcass should be put into the vat; the diseased viscera and tuberculous masses should be burned or buried deeply in lime. No restriction is necessary on the sale and removal of hides, horns, hoofs, or hair.

Insurance.—At the Seventh International Veterinary Congress, held at Baden-Baden two years ago, Professor Siedamgrotzky suggested a system of insurance which, if it could be carried out, would be a common-sense way of lessening individual losses consequent on eradication by slaughter of clinically diseased and reacting animals. This is surrounded by many practical difficulties, yet it is well worthy of the consideration of this Congress. An effort should be made to provide an indemnity fund by this or some other way, the public purse contributing a liberal share; otherwise, I fear that the progress made in eradication will be slow. In the State of Illinois, United States of America, indemnity is paid by the State on a plan which is worthy of imitation. A maximum value is fixed, at, say, £15. Diseased cattle are classified as follows after being slaughtered:—

	Indemnity.
Class A, in which no lesions are found...	Full appraised value.
,, B, in incipient stage	75 per cent. appraised value.
,, C, infected for one year	50 ,, ,, ,,
,, D ,, ,, two years	35 ,, ,, ,,
,, E ,, ,, three ,, ...	25 ,, ,, ,,
,, F ,, ,, over three years ...	15 ,, ,, ,,

Should the proceeds of the sale of the carcass exceed the percentage valuation the owner is paid the full amount so received.

Suggested legislation.—No legislation will accomplish the end in view unless the measures are such that the public are in sympathy with them rather than antagonistic to them.

I. Tuberculosis should be included in the list of contagious diseases. Tuberculous animals should consequently come under the provisions of the Animal Contagious Diseases Act; but the local authorities should have power to allow the sale and movement of such parts of the carcasses as are known not to carry contagion, such as hides, hoofs, horns, and hair, thus preventing unnecessary loss.

II. All foreign animals admitted for breeding or dairy purposes should be tested by the tuberculin test. Tuberculous animals should be prohibited from entering.

III. Tuberculin should be controlled, and none but qualified veterinarians should be allowed to use it, and all reacting animals should be reported, marked, and quarantined.

IV. All animals showing clinical symptoms of tuberculosis, especially disease of the udder, lungs, uterus, or bowels, should be killed at once, and all scrub and grade animals reacting should be killed within six months. Pure-bred cattle may be bred from under Professor Bang's system, in quarantine for life.

V. All testing, other than imported animals, should be by voluntary application for a test of the entire herd, and the expense should be borne by the State. A reaction of 2° to be understood to indicate tuberculosis, 1½° as suspicious. Suspicious animals to be quarantined and re-tested in three months, unless clinical symptoms develop, when they should be at once condemned. The Government to have the right to order a re-test when considered necessary.

VI. Disinfection of premises should be ordered by special regulations, the carrying out of which should be superintended by Government officials.

TUBERCULOSIS AMONG AUSTRALIAN STOCK.[1]

BY G. PENTLAND,
CHIEF INSPECTOR OF STOCK FOR THE STATE OF VICTORIA.

EARLY in the year 1883 the attention of the district and border staff was called by the late chief inspector of stock, Mr. Curr, to the fact that diseases of cattle known as tuberculosis (consumption) and "cancer" (lumpy jaw), now known as "actinomycosis," were becoming more common and appeared to be gaining ground. At that time little was known of the nature of these diseases, but the brilliant discovery by Professor Koch in 1882 of the cause of tuberculosis being a minute rod-like organism, the bacillus tuberculosis, awoke the scientists of the world to inquire into the value of this great discovery. In 1883 the Hon. James Buchanan, M.L.C., an experienced stock-owner, called the attention of the Victorian Government to the fact that it was necessary that a board of experts should be appointed "to inquire into the existence and extent in this colony of the disease in cattle known as tuberculosis, whether its existence is likely to be detrimental to the public health, and what preventive measures should be adopted"; and in 1885 the board recommended after very exhaustive inquiries that tuberculosis be placed on the schedule of contagious diseases under the Stock Act, 1870. This was done in the year 1887, and since then this department has been able to deal with visibly affected animals in the same way as pleuro-pneumonia and other infectious diseases. Previously to this power being given by law there was no power to cause tuberculous animals to be destroyed, although a large number were willingly destroyed by owners at the instance of inspectors, who, to a large extent, used moral suasion in these matters. We are now constantly destroying affected animals in the course of our inspections, both in the districts and on the borders, as the annual returns hereunder show. In the year 1893 special instructions were given by the Secretary for Agriculture to have all dairy cattle inspected as closely as possible by the district staff, and I think I am safe in saying that this instruction has been faithfully carried out. The district staff is composed of practical men experienced amongst stock and accustomed to country life and the ways of the bush. They have in the past been successful in stamping out scab, and have also met with great success in coping with, and keeping down, pleuro-pneumonia by the measures of slaughter, quarantine, and inoculation.

[1] A paper communicated to the British Congress on Tuberculosis, Section IV., Veterinary.

The duty of combating tuberculosis has fallen to the stock branch whose primary business is to see that infectious and contagious diseases are kept out by land and sea and to prevent the spread of any infectious or contagious disease within the State. Tuberculosis, pleuro-pneumonia, and actinomycosis are all imported diseases; they were introduced at a time when there was no department for their prevention or control, and hence they gained great headway in consequence and would do so again if there were no stock departments throughout Australasia to keep them in check. Besides having practical and experienced men to travel the districts, there are attached to the department six veterinary surgeons in private practice whose services are sought in special cases where special inquiry or demonstration is necessary. They are called upon, in conjunction with inspectors of stock, to inspect before landing all foreign stock arriving at port, and then again before release from quarantine. We thus have a staff equal to any emergency, and in the regulations we have hard-and-fast rules for the guidance of owners of stock and the general staff.

As regards the general condition of dairy stock, I reported in June, 1893, that dairymen as a rule vie with each other in keeping the best class of stock, it being the best cows that yield a profit, and that odd cases of tuberculosis crop up once in a way which they readily get rid of; but that on the whole the health of our dairy stock was excellent and would compare favourably with the same class in any part of the world. Owners are only too anxious to maintain the excellence that has been obtained. In a report dated Nov. 2nd, 1896, I stated that it was upon the principle of stock-owners, aided by the inspectorial staff, destroying diseased animals themselves that pleuro-pneumonia was kept in check, and it has been upon the same principle and with the same aid that tuberculosis has been got under. The greatest factor, however, we have in preventing the spread of tuberculosis is the open-air life which our cattle live, and this fact accounts for their greater freedom from tuberculous disease than the cattle of Great Britain, Denmark, and other European countries, which are housed and hand-fed for the best part of the year. On disease breaking out in the confined atmospheres of byres the infection spreads rapidly throughout, and there is a larger percentage of animals affected than there would be if they were living under more favourable conditions of hygiene. We therefore have an advantage over countries the climatic conditions of which are not so favourable as ours. The sun's rays, too, are all-powerful in destroying the bacillus of tuberculosis, and the success of any scheme for getting rid of and keeping rid of tuberculosis will depend upon cleanliness and upon having cowsheds and yards built so as to get as much sunlight as possible. It is to be remembered that darkness, dirt, overcrowding, and imperfect ventilation favour the spread of tuberculosis. No infected or suspected animals should be allowed to mix with healthy animals. Among the many ways of spreading infection is that of healthy animals licking affected ones; and in small dusty areas or yards where diseased animals have been the dry particles containing the germs of disease are floating about and are therefore a menace to man and beast.

Since 1885, the year of the board's report, which showed that 7 per cent. of all cattle were affected in various degrees, the percentage has been decreasing at a satisfactory rate according to the statistics obtained at the city abattoirs. In 1896 the return showed that all cattle were affected to the extent of 4 per cent., and a later return for 12 months ending June 30th, 1899, showed that bullocks were affected to the extent of 3 per cent., cows 5 per cent., and calves to the extent of one only out of 3935. For the year ending Dec. 31st, 1900, the return furnished by the superintendent of city abattoirs is as follows:—

Cattle.	Tuberculosis.		
	Number slaughtered and inspected.	Number affected in various degrees.	Number condemned and destroyed.
Bullocks	36,125	No record kept.	66
Cows	8,517		64
Calves	3,532		*Nil.*
Totals ...	48,174	—	130

The percentage of disease found at the city abattoirs is necessarily much greater than that found by inspectors in live stock, and therefore it is only the rough of the herds that is culled, so that affected animals showing no external signs escape; but, nevertheless, the general condition of our dairy and other classes of cattle is improved, whilst in every animal that is destroyed and the carcass burnt the centres of contagion are thereby lessened and kept in check and suspicious cases are dealt with under the tuberculin test or by isolation. The following statement shows the number of dairy and other cattle inspected and killed in the districts on account of tuberculosis for the period 1894–1900:—

Year.	Cattle.	Number inspected.	Killed for tuberculosis.
1894	Dairy	119,450	335
	Other	194,373	276
1895	Dairy	108,169	325
	Other	236,651	269
1896	Dairy	130,709	320
	Other	245,448	229
1897	Dairy	102,972	270
	Other	227,167	182
1898	Dairy	91,397	220
	Other	257,387	237
1899	Dairy	87,360	151
	Other	227,008	141
1900	Dairy	85,413	115
	Other	202,044	114
Total killed ...	—	—	3164

Owners of tuberculous stock are generally only too pleased to get rid of diseased stock without delay and without compensation, their motto being, "The first loss is always the best loss." No compensation was given in the cases of scab or of pleuro-pneumonia. It was only given when an outbreak of a new disease—foot-and-mouth disease—occurred in this colony about 30 years ago and in the case of some scabby sheep being illegally destroyed. Compensation for valueless beasts has not been asked for by owners of cattle or sheep, as they do not place any value on stock suffering from disease, and they readily consent to destruction without raising the question of compensation when inspectors make their condemnation. Clause 10 of the Act clinches this matter, as it provides that under an Order in Council owners of diseased stock shall have no claim for compensation when destroyed at the instance of inspectors. Diseased animals are usually destroyed and opened on the nearest available spot and the diseased parts are shown to the owner who profits by the object-lesson. This course is highly educational to them in getting affected beasts destroyed at once, without waiting for the action of the department. In the case of the tuberculin test I may state that owners of apparently healthy animals reacting and slaughtered, and showing but slight lesions, complain of the losses they sustain, and would claim compensation in such cases if the tuberculin test were compulsory. Some owners argue that their cattle might live for years where the lesions are slight and might heal up or make no further progress; but, on the other hand, if the test disclosed generalised tuberculosis, or one or more organs were badly affected, then they would not apply to be compensated.

The Diseases in Stock Act, 1890, consolidating the laws relating to diseases in stock, provides by Section 6 that inspectors of stock shall have power to enter at any time into any ship or any land, or into any building, not being a dwelling-house, for the purpose of inspecting any stock. This is a power which enables an inspector to find out for himself the state of his district as regards disease, and has a certain amount of influence among stock-owners in reporting disease. I understand that in England inspectors have no such power, and if this be the case owners of affected stock can do just as they like—they may either report disease or give notice of such for compensation or may send stock that has been in contact with affected stock to the market yards for sale, since they have nothing to fear whilst an inspector has no power of entering. Regulations for placing diseased stock in quarantine are in force in this State and this power judiciously exercised enables an inspector to have affected stock destroyed at once, with the consent of the owner. The owner readily consents to destroy

affected stock, knowing the power the inspector has in seizing and quarantining diseased stock and placing all other stock in quarantine. The owner, however, can refuse to destroy his affected stock until an Order in Council is obtained and in this he has the right to appear. As regards foreign and inter-State stock we have sufficient power to fix any condition that may be justifiable for introducing certain kinds of stock, and this enables us to prevent animals being introduced by sea or land if they are affected with tuberculosis or any other disease, and the Health Act gives power to prohibit the entry of any kind of stock whether diseased or not. Members of the police force generally assist the district inspectors. The districts, however, assigned to each inspector for the inspection of dairy cattle are too large and unwieldy and the requirements of the dairying industry, which has grown so large of late years, justify closer and more regular inspection than obtains at the present time.

Unlike other infectious and contagious diseases tuberculosis is so slow of development that it is impossible to say how many animals in a herd are affected. It was hoped, when the tuberculin test was discovered, that results of a satisfactory nature would be afforded to the cattle-raising industry, but so far there does not seem to be any great desire on the part of Australian cattle-owners to have the test applied to their herds. The cattle that react should be "dried off" and fattened for slaughter, whatever the result may be when opened. The test, considered from the most favourable point of view, has its advantages and disadvantages, so that to make it a Government measure having for its object the destruction of reacting animals a compensation fund would certainly require to be provided and in this matter it has been estimated that in England it would take £19,000,000 sterling to get rid of the disease. Three and a quarter millions of cows would have to be taken from the milking-sheds and slaughtered. This is a very grave matter and points to the necessity of other alternatives or ameliorative measures being devised. I know of no better method of gradually getting rid of tuberculosis than plenty of fresh air, sunshine, and slaughter of visibly affected beasts. The sun's rays are death to the bacillus of this disease, therefore every effort should be made by the people in the old country to try hygienic methods for the cure of tuberculosis both in man and beast. This fact is sufficient for the local authorities to have sanitary laws enforced, the doing away with everything that tends to promote disease, the thorough ventilation and drainage of byres, and the cleaning and keeping clean of all cows in milk and the utensils and gearing used in connexion with the dairy. These matters cannot be repeated too often, for it stands to reason that the more fresh air we get the more vitality we have of resisting the enemy. A stock-owner has a perfect right to get rid of disease in his dairy herd in the same way as Her late Majesty the Queen did in getting rid of the cows which reacted to the tuberculin test at Windsor. This is a matter which touches the pockets of owners directly, and no one can take exception to any owner attempting to purify his herd in the most effective manner he can.

The United States have not been slow in following up the discovery of Professor Koch's tuberculin cure for consumption in the human being. The State of Vermont some years ago made experiments in regard to the test. One of the objections taken to it was that tuberculin does not determine the stage of the disease but condemns animals that might live for years and possibly recover. This objection seems to me a fatal one in respect to making the test a compulsory measure, and therefore it can only be a means of privately finding out whether tuberculosis exists or not. It appears, therefore, that we have yet to hear of other scientific methods of a more exact nature than that disclosed by the tuberculin test. The test does not allay the progress of the disease, but on the contrary increases its severity, stirs the minutest lesions, and therefore brings to a climax the disease in a generalised form which otherwise might have lain dormant for all time to come. We have to apply preventive methods as the easiest and surest way of dealing with tuberculosis, and if the tuberculin test is not allowed in the case of the human being, why should its use be advocated in the case of the bovine species? Some of the cattle-breeders of the United States and Canada have protested against the use of tuberculin as a test for pure-bred cattle being allowed to be imported, on the ground that it is "unreliable and unsatisfactory," and in the same sentence it is pointed out that it is of great use to the cattle-owner who wishes to maintain a healthy herd, but that imported stud cattle should not be subjected to the test. As regards this exception I can only say that importers of pure-bred cattle in the State of Victoria have it in their power to have their cattle tested if they please before shipping them from foreign ports, and this has been done in one or two instances within the last two years. The quarantine of all suspected animals should be insisted on which react to tuberculin, with the alternative of immediate slaughter if quarantine cannot be maintained. I have lately heard of a stock-owner having gone to the trouble of getting his herd subjected professionally to the tuberculin test and then when the animals which were put away to fatten had been killed the tuberculin test proved to be satisfactory. Cases of this kind I should be glad to have made official or at any rate brought under official observation.

ON THE MORTALITY AMONG RATS AT THE CAPE TOWN DOCKS WHICH PRECEDED THE PRESENT EPIDEMIC OF PLAGUE.

BY ALEXANDER EDINGTON, M.D., F.R.S. EDIN.,
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IN the report of the meeting of the Epidemiological Society on May 17th, as published in THE LANCET of June 1st, p. 1541, certain remarks are contained with reference to a mortality among rats in the Cape Town Docks and Dr. Klein is reported as having said: "Dr. Edington now admitted the mortality among rats at Cape Town and had sent cultures obtained from them to several bacteriologists, including himself. There was no doubt as to their being true plague bacilli, Dr. Edington's failure to recognise them having been due to his employing unsuitable media." Since this statement is totally inadequate and, as a matter of fact, really misstates the case I have thought it advisable in the following brief account to recount the facts of the case.

I arrived at Cape Town *en route* to my headquarters at Grahamstown on Feb. 5th. At Cape Town, however, I was detained by the Honourable the Colonial Secretary in order to investigate an alleged mortality among rats at the docks. Accounts from reliable persons went to show that rats had been dying at the docks in some appreciable numbers, but in an official letter of Feb. 9th the Table Bay Harbour Board stated in regard to the alleged mortality that it had been "brought to the notice of the board's officials and it was attributed to the energies of the rat-catcher which had been newly awakened by the threatened appointment of another man." I found, in so far as my information went, that rats had been dying in appreciable numbers for two months previous to my arrival. Professor Simpson, in a recent address given to the Cape Town branch of the British Medical Association, states that "the sickness and mortality among rats prevailed for at least four months before the first recognised case of plague. This is a long time to elapse without any manifestation of the disease in man."

Immediately that I had been asked to make an investigation the Under Colonial Secretary, at my request, issued instructions that rats found dead or dying at the docks should be immediately sent to me. Despite every effort, however, during the following six days no rats were found and I was forced to report at that time that so far no evidence had been brought before me which could enable me to say that rats were dying from plague. On the following day, however, a rat was brought to me from the south arm of the dock (the area in which the mortality had actually been observed formerly) and a number of rats from other parts. Of those brought from other parts not one was found which showed the slightest evidence of disease. I ought to say here that with two exceptions all of them were alive and in perfect health, while of the two which were dead no evidence of disease was found at all. That one, however, from the south arm showed conditions which are of very great interest and I shall refer to it in detail. Meanwhile, having heard on Feb. 10th that several suspicious cases of sickness in man, together with one which I had just seen, had been removed to the isolation camp at Uitvlugt, and

having received authority on Feb. 11th to examine these, I proceeded there on the morning of Feb. 12th. On my arrival I found that 12 patients had been admitted, most of whom had well-marked buboes, either in the femoral or axillary regions. I opened into most of these buboes with a sterilised hypodermic syringe and in the material thus collected I was able in most instances to demonstrate the presence of the plague bacilli. Thereupon I reported officially to the Colonial Secretary on Feb. 13th "that the disease now appearing in Cape Town is undoubtedly the bubonic plague."

Cultivation experiments were also successfully carried out, and since that date I have produced the disease by inoculation of the cultures in guinea-pigs and rabbits. I was detained at Cape Town for only a fortnight, and as when I arrived there originally I had no materials for culture experiments I telegraphed to Grahamstown for them and they arrived four days later. All the culture material (agar-agar) came from one batch and upon it the human plague bacilli reproduced themselves in characteristic microscopic form and have retained their virulence in successive transferences until now when it (the original strain, not passed through an animal) is now showing a very definite declension in virulence. I have referred to this thus fully as controverting the statement that I had used unsuitable media, since the bacilli of the rat plague, grown on the same media and inoculated simultaneously with the human plague, produced bacteria of the most diverse character.

But to return to the case of the rat from the south arm. It was examined with the assistance of the principal veterinary surgeon, Mr. Duncan Hutcheon, M.R.C.V.S., and a very complete dissection was made. On removing the skin no injection of the subcutaneous tissue was observable, nor were any enlarged glands found either in the axillary, femoral regions, nor, afterwards, in the abdomen. On opening into the abdomen no peritoneal exudation was seen, while the intestines were quite normal. The adrenals were pale and slightly enlarged, but the kidneys were normal. The spleen, which consisted of a mere ribbon, was certainly not enlarged, while its consistence was normal. The liver was slightly congested. No enlarged glands were found. On opening into the pleural cavity we found a large collection of clear yellow exudation. The lungs otherwise appeared absolutely healthy. The pericardium was also filled with clear yellow exudation to such an extent as to make the membrane tense. No hæmorrhagic exudations were found in connexion with the heart-muscle or the endocardium. Thus far the post-mortem examination had failed to reveal any suggestion of plague infection. Cultivation experiments were instituted with the spleen-pulp and the blood of the heart, the results of which I shall refer to later. Microscopical examination was made of the blood from the axilla and also from the heart, whilst smears were made from the liver, spleen, adrenals, and kidneys. In all of these, and especially the spleen, large numbers of a somewhat ovoid bacterium were found. These were very regular in size and shape and did not show bipolar staining either with Löffler's blue or gentian violet. They were thus in marked contrast with the bacilli found in the human buboes, in which typical bipolar staining was found in every case. I therefore reported in regard to my examination of the various organs, blood, &c., that "in all of these, but least of all the suprarenal capsules, there are numbers, often innumerable, of a microbe which is somewhat similar to one stage of the plague bacilli, with which, however, it differs in many respects."

As I was under instructions, dated Feb. 16th, having already declared the disease at Cape Town to be bubonic plague, to proceed to Grahamstown and to re-assume the charge of the Bacteriological Institute no inoculation experiments could be carried out until I should have reached that place. The cultures of the rat disease and the human plague, both, as I have stated, having been made in the same media, showed the most striking and diverse microscopic form. While the human plague existed as small more or less ovoid bacteria, most of which showed bipolar staining, the rat microbes presented larger irregularly spherical forms with some irregular filaments, and approximated to very exaggerated involution forms of plague. These latter grown in bouillon, inoculated with the merest trace of an agar culture and incubated for 24 hours, were used for the inoculation of guinea-pigs, rabbits, pigeons, one cat, and one baboon. These animals when inoculated each received 10 drops, excepting the pigeons, one of which received five drops, the other only a trace.

Guinea-pigs.—The first, inoculated with another, on March 1st, died within two days. The subcutaneous tissue around the area of inoculation was occupied by an immense pale gelatinous œdema. This œdema extended from the groins over almost the whole ventral surface. The site of inoculation was almost œdematous and the track of the needle was marked by a slight hæmorrhagic exudation. The only other trace of such hæmorrhagic character was a small area 10 millimetres in diameter on the left side. The œdema was remarkably free from any hæmorrhage and was in parts about six millimetres in depth. This œdematous condition is an essential characteristic, while the absence of hæmorrhage is equally so, in all animals inoculated. The spleen was slightly enlarged, showed no white spots, and was of normal consistence. A few glands were found enlarged in the axillæ, groins, and in the mesentery. These, however, were œdematous rather than enlarged, were semi-transparent when held to the light, and emitted a semi-transparent fluid when cut into. The second guinea-pig died on the following day. Here the conditions were similar to the former, with the addition that the spleen showed white points somewhat similar to what is found in true plague and the pericardium contained some clear yellow exudation. In neither case were the lungs found to be inflamed. In other guinea-pigs similar results have been found.

Rabbits.—Two rabbits were inoculated with the original culture and two with a culture recovered from the spleen of a guinea-pig, but in neither of the cases was any illness produced. Cold abscesses were found at the seat of the inoculation which proved to be sterile. The first two rabbits were thereafter inoculated with cultures from the human plague, and in each case died from bubonic plague.

Baboon and cat.—In the cases of the baboon and cat neither were affected by the inoculation.

Pigeons.—In the case of the pigeons two were inoculated on March 26th. The one which received five drops died early on the morning of March 31st, while that which had received but a trace of the bouillon culture died on the following day. In both pigeons and guinea-pigs the rat microbes were recognised in the blood and organs, while cultures of the bacilli were also easily obtained in every case. The blood of the pigeons was in both cases most prolific in bacteria and the smallest trace transferred to agar gave rise to confluent colonies of the microbe. In the liver of the pigeon the bacteria showed greater tendency to bipolar staining than in any other situation.

Although the cultures of the rat microbe are very similar to the somewhat non-characteristic growth of plague, and although the cultures in buttered bouillon give rise to stalactite growth, yet the microscopical form of the bacteria in the body of the rat, together with its pathogenic action, are somewhat at variance with what we know of true plague bacilli. Moreover, I have had numerous opportunities of observing rats affected with bubonic plague in Port Elizabeth, but, although I have found an abundance of plague bacilli more or less virulent in action, I have not seen one case in which the rat microbe found in the early mortality at the south arm of the Cape Town Docks has reappeared. I must, therefore, until further observations have otherwise convinced me, adhere to my belief that the disease which primarily caused the mortality among the rats at the Cape Town Docks was not true bubonic plague, although being undoubtedly a variety of the bacillus of hæmorrhagic septicæmia.

Grahamstown, South Africa.

WALLINGFORD COTTAGE HOSPITAL. — This hospital, which has hitherto been very slenderly endowed, has recently received a substantial addition to its resources. The sum of £1010 has been subscribed for the purpose of endowing a bed as a memorial of the late Mrs. Helen Mary Wells, who took an untiring interest in, and rendered much active help to, the hospital from its foundation in 1878 to the time of her death in September last. During that long period she was one of its lady visitors and her cheerful presence was ever welcome to patients and officials alike. The money has been invested in Local Loans Stock in the names of the Official Trustees of Charitable Funds and a presentation brass bedstead of the Lawson Tait pattern, with a memorial plate over it, has been set up in the principal ward. A dedication service was conducted last week by the Rev. Sir J. L. Hoskyns, Bart., rural dean, when the attendance was more than sufficient to fill the ward, great interest being manifested in the proceedings, which were of a very impressive character.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv., Proœmium.

SHEFFIELD ROYAL INFIRMARY.

A CASE OF STRANGULATED INGUINAL HERNIA; ENTERECTOMY; RECOVERY.

(Under the care of Mr. ARTHUR CONNELL.)

IT is now generally recognised that immediate resection of the gangrenous bowel is preferable in strangulated hernia if the general condition of the patient will admit of it. Such primary resection saves the patient the risk of a second operation for closure of the fæcal fistula, and also, if the gangrenous portion is in the jejunum, it saves him from the risk of inanition which may result from insufficient absorption. It is still, however, sometimes necessary to open the gangrenous bowel and to allow a fæcal fistula to form, if the age of the patient and the duration of strangulation appear to indicate that the prolongation of the operation would lead to a fatal issue.

A man, aged 21 years, a labourer, was admitted into the Sheffield Royal Infirmary on June 1st, 1901, suffering from symptoms of strangulated hernia. On questioning the patient the following history was elicited. Twelve months before, whilst at work, he was suddenly seized with a sense of something giving way in the abdomen, followed by violent pain and accompanied by a swelling in the left inguinal region; he immediately went to bed, the hernia being reduced by his medical attendant. Since the first attack the bowel had frequently come down, but the patient had been able to return it into the abdomen. On the present occasion, however (May 29th), the hernia was very much larger and all attempts at reduction both by himself and by his medical attendant having failed he was sent to the infirmary. On examination a very large scrotal tumour was found to be present on the left side, extending from the internal abdominal ring to the bottom of the scrotum. The skin of the scrotum and penis was markedly œdematous and ecchymosed. The patient was suffering great pain, accompanied by vomiting. There was neither any action of the bowels nor did he pass flatus after the descent of the bowel. The swelling was exceedingly tender to the touch, hard, tense, dull on percussion, and apparently irreducible. (No attempt at reduction was made in hospital.) There was the well-marked urethral discharge of gonorrhœa present at the time.

At 12.30 P.M. on June 1st Mr. Connell operated. Ether being administered, an incision was made along the left inguinal canal, extending from above the internal abdominal ring to one and a half inches below the external ring. On opening the sac some blood-stained serum with an offensive smell escaped; immediately the exposed region was thoroughly irrigated. The stricture was now divided and the omentum, which was very dark and found lying in front firmly adherent to the sac, was ligatured in several pieces and divided, forceps being attached to the proximal portion in order to prevent it slipping back into the abdomen. After treating the omentum the gut was withdrawn from the sac and found to be black and without gloss, and on handling it it was very hard and of a leathery consistence. At the point of stricture the gut was considerably damaged and as all pulsation in the mesenteric vessels had ceased enterectomy was performed. The gut, having been clamped above and below by means of Doyen's broad ligament forceps covered with indiarubber tubing, was divided, 16 inches being sacrificed. The mesentery was divided along the line of its attachment to the gut and the bleeding vessels were clamped; little or no blood escaped from that portion of the mesentery corresponding to the blackened intestine. A continuous suture interrupted at intervals now brought the two layers of the mesentery together. The bowel being irrigated and cleaned a second time, the two ends were placed side by side and united by immediate suture—one set of continuous sutures interrupted twice for the mucous membrane and a second set of the same type for the sero-muscular coat. The super-abundant mesentery, falling into natural folds on suturing the gut, was sutured after the manner suggested by Mac Cormac. The parts were reduced after careful overhauling and the operation was completed as for inguinal hernia. Recovery was uneventful, the patient leaving the infirmary on June 22nd feeling quite well. Flatus was passed during the night of the 1st.

Remarks by Mr. CONNELL.—One is not often called upon nowadays to operate in such advanced cases of strangulation in external hernia, except, perhaps, in some cases of femoral hernia which are attended with unusually rapid pathological changes, and I venture to place on record this case which was somewhat acute. That the condition of the gut (small intestine) found at the operation after three days' strangulation should be so far advanced was, to say the least of it, surprising, but may be accounted for perhaps by the following factors acting together—(1) the congenital type of the sac; (2) the presence of a large quantity of omentum in addition to the gut; (3) the enormously swollen cord secondary to the gonorrhœal epididymitis; and (4) the powerful muscular development of the abdominal wall. Cases of enterectomy for strangulated hernia are attended with a high mortality, and it is not surprising when one considers the auto-intoxication which takes place where the vomiting has become stercoral, as in this case. Fortunately for this man, his powers of resistance were in evidence and played no inconsiderable part in the recovery. It is a pleasure to me to express my indebtedness to Dr. John Broadley, the house surgeon, for the notes and for the great care and attention of the patient after the operation.

Reviews and Notices of Books.

Introduction to the Study of Medicine. By G. H. ROGER. Authorised translation by M. S. GABRIEL, M.D., with additions by the author. London: Henry Kimpton. 1901. Pp. 550. Price 21*s*.

THE translation which we have before us is a reproduction in English of the course of lectures delivered by Professor Roger at the University of Paris during the year 1897-98. This course of lectures was instituted by the faculty of the university as a means of introducing to students at the commencement of their professional education the principles and aims which should guide them in the subsequent pursuit of scientific knowledge. To read these lectures is to admit that Professor Roger has fulfilled this object in the most admirable manner. In view of the remarkable advances witnessed during the last decade in what may be called the technique of laboratory diagnosis it is interesting to note the following pronouncement on the part of the author, who is no less famous for original research in the laboratory than for success as a practical clinician. "It seemed to me important to oppose the tendency of some modern authors who think that the solution of problems raised by the examination of patients can be found in laboratory researches. No one is more firmly convinced than myself of the usefulness of experimental pathology; nevertheless, at the bedside the physician can do no better than to depend upon clinical procedures. Only in quite rare instances will he be obliged to resort to more delicate methods of investigation. I cannot admit abdication of clinical methods before the rising tide of bacteriology." It is clear to the careful reader that this is the underlying "motive" throughout these lectures, and the considerable space—some 200 pages—which is devoted to the examination of the sick at the bedside is convincing proof that the unaided application of the senses can lead to practical results in diagnosis.

The arrangement of the various sections is simple and methodical. In the early chapters the student is introduced to the causes which interfere with the physiological processes of life; those that follow explain the reaction of the organism to these external causes and introduce the

reader to the essentials of morbid anatomy and the objective and subjective manifestations of disease. From the beginner's point of view it is probable that the chapters which deal with the examination of the sick will prove of the greatest value, while advanced students and practitioners will appreciate more highly the philosophic representation of the processes of general nutrition, the auto-intoxications under normal and abnormal conditions, the significance of diatheses, the pathology of the fœtus, and the influence of heredity. With regard to diatheses, the reader will notice that Professor Roger follows closely the teaching of Bouchard. He rejects the conception of tuberculous, syphilitic, cancerous, and other diatheses, and admits of two only—namely, the scrofulous and the arthritic. He defines a diathesis as a particular mode of nutrition: arthritism as a sluggishness of nutrition, scrofulosis as a failure of carbohydrate and nitrogenous assimilation. The effect of these particular forms of metabolism is to induce morphological characteristics and pathological processes of nutrition which are easily recognisable in individuals who conform to one or other of the above types. Arthritism is the inheritance of civilised people and of the upper classes. Most individuals with a superior intelligence are tainted with it. Scrofulosis is found in children born of parents in bad health suffering from some chronic intoxication; they are weaklings with flaccid muscles, long and silky eyelashes, hypertrophied tonsils, and wide noses. These nutritive disorders, whether the result of infective or autochthonous intoxication, may be transmitted to the children, but the most serious manifestations of such failures of metabolism are not necessarily perpetuated in descent; healthy surroundings for mind and body may retard or even definitely prevent the display of the worst features of such hereditary taint, they may only become apparent under the influence of the appropriate stimulus—in other words, they are preventable.

The few pages which are devoted to the consideration of genius, insanity, and crime are intensely interesting and suggestive. The views of the author are not absolutely in harmony with those of Lombroso and his school on the mutual relationship of these mental conditions. Professor Roger, while admitting that there are affinities between genius and insanity on the one hand and between insanity and crime on the other, will hear of none between criminality and genius. He considers that men of genius are superior degenerates, criminals to be inferior degenerates. Genius and crime are the two converging (or diverging) sides of an angle which has insanity for its apex. This is the only point at which these lines meet; the further they are extended the more divergent they become. These are but a few of the interesting problems which the author tries to solve in words which can be understood by an audience only imperfectly equipped with a knowledge of medicine. But for both student and practitioner this introduction to the study of medicine is, indeed, as the translator expresses it, "a fascinating journey into the regions of medicine where the most important developments have recently been realised." In conclusion, we must congratulate Dr. Gabriel upon the successful manner in which his translation reflects the brilliant literary style of the original text.

The Cambridge Natural History. Edited by S. F. HARMER, F.R.S., and A. E. SHIPLEY, M.A. Vol. VIII.: Amphibia and Reptiles. By Dr. HANS GADOW, F.R.S. London: Macmillan and Co. 1901. Pp. xiii.–668. One coloured plate and 181 figures in the text. Price 17*s.* net.

DR. GADOW has done his best to disprove at least the latter half of one of Linnæus's crisp phrases which he quotes in his preface. "Amphibiologi," wrote Linnæus, "omnium paucissimi sunt nullique veri." Dr. Gadow has in his lengthy volume given us an account of both amphibia and reptiles which should satisfy the expert zoologist and at the same time entertain the reader who is merely interested in the tit-bits of natural history. Much that Dr. Gadow has to say will be new to most readers, and all, so far as we have tested him, will be found to be true. Besides, he is an expert in the groups of which he treats, more particularly of the reptiles; and this is precisely the most satisfactory character about this and the other volumes of the Cambridge Natural History; we can always follow our instructor with confidence, for which we have to thank the editors of the series.

The gentlemen entrusted with the editing of the Cambridge Natural History have been wise in not insisting upon long disquisitions upon toads immured in limestone rocks of the carboniferous period, upon vipers swallowing their young, upon the sea-serpent, and those various topics so intimately connected with the animals treated of in the present volume which appeal so strongly to the "energetically ignorant." In spite of these omissions, or scant and uncourteous references, Dr. Gadow's volume will be found to be in the proper sense of the word "popular." There is not an anecdote told of frog, toad, or lizard that has not a definite and important fact to state or to explain. There is an entire absence of that tiresome facetiousness sometimes supposed to be necessary in dealing with natural history. Instead of this we find an easy and by no means monotonous account of the ways and life histories of a large series of amphibia and reptiles. A considerable portion of the book is naturally anatomical. And here Dr. Gadow is on familiar ground, constantly traversed and retraversed by himself in his own investigations; even those sections which deal with "bionomics" are by no means mere quotations from the observations of others. A large number of amphibians and reptiles of many kinds have been kept by the author and carefully noted and surveyed. The result is a book full of accurate information and pleasant reading. Dr. Gadow does not commit himself much to theory; he deals warily with many controversial points. Fierce and frequent have been the discussions of late concerning the meaning of many facts in animal colouration. In no branch of biology, perhaps, has theory so completely out-distanced fact. It has been asserted that the proteus, that singular blind and white newt-like creature inhabiting the caves of Adelsberg, owes its loss of colour to the absence of necessity for any particular colouration in a locality where there is no one to appreciate it. The useless colour, like the useless eyes, have, it is held, disappeared for this reason. To suggest a plain and homely action on the part of environmental forces was to become the very worst kind of heretic. And yet Dr. Gadow quotes Mr. Bles to the effect that the proteus when removed from its caverns and made to live a reasonable out-door life "turns ultimately jet-black." The changes of colour of the chameleon have engaged the attention of naturalists as well as of poets. Some of the former have attempted to insinuate that these changes are mainly, if not entirely, for protective purposes. Excitement, anger, cold, and heat seem to be at least as potent factors in determining a change of hue, and Dr. Gadow thinks that "adaptation to their immediate surroundings takes place to a very moderate degree only."

Much has been written, especially in America and by the late Professor Cope and Professor Marsh, of those often monstrous creatures of the Mesozoic period—the dinosaurs. The great interest attaching to these archaic reptiles is naturally their supposed relationship, indeed alleged ancestry, to the modern birds. To the late Professor Kitchen Parker it appeared ridiculous that an 80-feet dinosaur wallowing in oolitic mud should have given rise to that tiny pinch of feathers called a humming bird. But after all the shock to the sense of fitness of things is not very much greater than that inflicted by the certainty that the extinct New Zealand

moa towering over the tree ferns is most unquestionably of common origin with the same humming bird. Size is not a difficulty in judging relationships. The real difficulty in this matter is plainly put by Dr. Gadow. The earliest bird—the familiar, even notorious, archæopteryx—is in almost every sense of the word a bird of the most unmistakeable kind. As the dinosaurs antecedent to this bird with its mediæval hand show no indications whatever of an approach to the bird type of structure greater than those shown by dinosaurs contemporaneous with or subsequent to the archæopteryx it seems inconceivable that we are to look for the avian tree in this direction. The dinosaurian suggestion is undoubtedly strengthened by the greater probability that they were warm-blooded and had air-sacs like birds; but it is nevertheless merely tantalising in the present state of our knowledge. This group of reptiles is one of the best instances of a dominant group. They ranged in size from that of a crow to perfectly gigantic proportions and showed much variability of structure and naturally concomitant variability of habit. Why they disappeared is one of those puzzles which there are at present no data to explain. It seems impossible that the tiny mammals which began to appear in their day with their defenceless bodies and slinking ways can have got the better of them in the struggle for existence. In default of any better explanation we must have recourse to such comfort as we can get out of the homely saying, "Every dog has his day."

The chapter on Snakes and their Poison will naturally appeal to many of the readers of this review. The actual symptoms are detailed in the case of several of the more venomous species, and these details are extracted from Professor Clifford Allbutt's "System of Medicine." Dr. Gadow says that several species of birds and mammals are "immune by nature" against the poison of serpents. This matter is one of very great interest, but we had thought that "mithradatism," as it has been proposed to call this fortunate disposition after the unpoisonable King of Pontus, was more usually replaced by special activity on the part of the snake-eating creature. The mungoose, for example, which was imported at one time into Santa Lucia and some other islands of the West Indies to cope with the fell trigonocephalus, is, at least by many, believed to owe its apparent immunity to its agile way of leaping aside from the serpent and then at the right moment leaping with equal agility upon the back of its head. There is, of course, the legend that the mungoose when bitten eats of a particular herb which at once neutralises the venom; but this suggestion does not, we should imagine, demand serious discussion in these columns. A highly disconcerting habit of many of the viperidæ is related by Dr. Gadow: it appears that the common English viper and the asp which bit Cleopatra, cerastes, have the uncomfortable habit, not possessed by other beasts of prey, of being attracted by the camp fire. Dr. Gadow combats the superstition that the rings on the "rattle" of the rattlesnake have anything to do with its age; they are not at all, as some think, comparable to the rings of trees in their significance of age. They are, however, useful to the casual stroller in American forests by warning him of the presence of their deadly owner, a circumstance which might appear at first sight a little too altruistic for adoption by Nature. It must be remembered, however, that the advantage is probably mutual; the snake does not want to be trodden upon although it may bruise the heel of the traveller by way of a retort. Dr. Gadow does not mention an interesting analogy pointed out some years ago by Dr. Günther between the tail of the rattlesnake and that of the porcupine. In both creatures there is a rattling and warning apparatus upon the tail which is in both formed of hardened epidermic structures.

We have picked out a few matters from this solid but easily assimilable volume for the purpose of illustrating its exceedingly thorough nature. Its usefulness and interest to the general reading public is much increased by the numerous figures, many of them new and prepared specially for this volume by the skilful pencil of Miss Bateson who has in most cases drawn her subjects from the life and in characteristic attitudes.

Public Water-Supplies, Requirements, Resources, and the Construction of Works. By F. E. TURNEAURE, C.E., Professor of Bridge and Sanitary Engineering, and H. L. RUSSELL, Ph. D., Professor of Bacteriology, University of Wisconsin, with a Chapter on Pumping Machinery by D. W. MEADE, C.E., M. Am. Soc. C.E., &c. First edition. New York: John Wiley and Son. London: Chapman and Hall, Limited. 1901. Pp. 750. Price $5.

IT may be well to give a general outline of the scope of this book which deals chiefly with the conditions found in the northern part of America.

In the preface there is a brief introductory chapter which will be referred to presently. The main body of the work is divided into two parts. Part I. deals with Requirements and Resources, and Part II. with the Construction of Waterworks. A study of the book shows that by "resources" the authors refer to the sources of supply, and this part of the book contains chapters on Rainfall, on Evaporation and Percolation, on the Flow of Streams, and on Ground-water. The second section of Part I. deals with the Examination of Water-supplies, with the Quality of Water derived from Various Sources, and with the Connexion between Water-Supplies and Communicable Diseases. In dealing with the quantity of water required the authors give tables showing the amount which is consumed per head in the case of many cities. Although few towns in the United States use any considerable amount of water for ornamental purposes, yet the total amount which is said to be supplied is very great, and it may be not without interest to notice the time of the day during which the greatest amount of water is used. A table is given of the rate of consumption in Boston, Massachusetts. The smallest amount is taken between the hours of from 1 A.M. to 4 A.M., but the rate at which water is supplied during that time amounts to no less than 40·8 gallons per head per day. The greatest amount is used between 7 A.M. and 10 A.M., and during these hours the rate is that of 103·8 gallons per head per day. The average amount taken per day is 73·6 gallons per head. It seems possible that a large proportion of the water is lost in American cities through defective mains, and in favour of this hypothesis it may be stated that the authors of the book under review state that one engineer "specifies" the maximum of "allowable leakage" to be from 60 gallons to 80 gallons per mile per inch of diameter of pipe, and another engineer showed that a leakage of 6400 gallons per head per mile took place from a 24-inch pipe under a pressure of 110 pounds per square inch. It is stated also that cases of breaches of four-inch and six-inch mains have remained undiscovered for a long time and that the water has flowed away through adjacent sewers to the amount of 100,000 gallons in 24 hours. Another cause of the greatness of the amount of water used in American cities appears to be that taps are often allowed to run continually. This practice is extremely common during the cold weather and it is adopted as a means of preventing freezing of the water in the pipes within the houses.

A table given in regard to the sources of water-supplies in the United States is of some interest. It appears that out of a total of 3356 organised supplies given 38·2 are derived from surface waters—that is to say, from rivers, from lakes, from impounding reservoirs, or by some combination of these different sources. Ground-waters are used in 54·2 per cent. of the supplies. This figure is made up in the following way: shallow wells, 25·7 per cent.; artesian wells, 10·1 per cent.;

springs, 14·9 per cent.; galleries and tunnels, 1 per cent.; and a combination of these different systems, 2·5 per cent. Surface and ground-waters—that is to say, a combination of the two chief classes given above—are used in 7·6 per cent. of the total organised supplies, and this number is made up as follows: rivers and ground-waters, 6·1 per cent.; lakes and ground-waters, 0·9 per cent.; and impounding reservoirs and ground-waters, 0·5 per cent.

Dr. Russell is responsible for the chapters on the Examination of the Water-supplies, for the one which deals with the Quality of the Water, and for one on the Spread of Communicable Diseases by Means of Water-supplies. In these chapters an account of the methods of physical examination employed in estimating the purity of the water is given and there are details concerning its chemical, bacteriological, and microscopical examination. The importance of sanitary surveys of the sources of supply also receives some consideration. The quality of "meteoric" surface and subterranean waters is discussed and there are remarks on the effect of the storage of water. The chapter specially devoted to the question of the spread of diseases which are usually disseminated by water contains accounts of epidemics of typhoid fever, of cholera, and of anthrax. The author does not show any knowledge of the work which was done by William Budd and by John Snow in regard to the spread of communicable disease by water, and a study of this part of the work lends support to the belief that the English literature on this subject is not generally familiar to American writers.

The part of the book which deals with the collection of water contains chapters on impounding reservoirs, on earthen embankments, on masonry dams, and on timber dams. The means adopted for the purification of water are dealt with at some length in the chapters on Sedimentation, Sand Filtration, Mechanical Filtration, and Miscellaneous Purification Processes. In regard to sand filtration Dr. Russell, who is responsible for this chapter, makes the remarkable statement that it is interesting and valuable to note that this process was developed empirically. As a matter of fact, the work undertaken by Mr. James Simpson for the Chelsea Waterworks Company and the results at which he arrived were by no means empirical. The work which it was desired to do was to remove from Thames water the grosser impurities, and after a series of investigations Mr. Simpson perfected a filter bed which accomplished the purpose he had in view and which formed a model from which but little modification has taken place since. The chapter on Sedimentation contains some account of observations which are of considerable interest. It is said on the authority of Fuller that the sediment contained in the Ohio river varies from one part to 5000 parts per million, that the ordinary range of variation is from 100 parts to 1000 parts, and that the number of bacteria varies from a few hundreds to 50,000 per cubic centimetre. The size of the particles held in suspension varies greatly. Suspended particles when the water is at rest carry down with them a number of bacteria. Dr. Russell remarks that sedimentation as a purifying process has long been known in England. This is true. The process of sedimentation was used for the purification of water in England for centuries before America was discovered by Columbus.

It does not appear necessary to do more than to indicate the arrangement of the information which is given in regard to the Distribution of Water. It is dealt with in chapters which refer to pipes, to conduits, to pumping machinery, and to reservoirs. A few words must, however, be said with regard to the historical sketch with which the book commences. The authors touch upon such interesting subjects as Jacob's Well at Cairo, the wells of Greece, of Syria, of Persia, and of China. They reproduce illustrations of the Roman aqueducts which have already appeared in a book by Mr. Herschel. This engineer, it may be remarked, made a calculation as to the amount of water which was formerly supplied to Rome and his results are adopted by the writers of the present book. It may, therefore, be worth while to state that the data upon which Mr. Herschel formed his conclusions were not sufficient for the purpose. The information given in regard to the water-supply of London is not great in amount—a matter, perhaps, which hardly calls for regret. The authors state that "in London various pumps were erected on the bridge [London Bridge] from time to time which drew their supply from the river and were operated by the current." The pumps were not erected on London Bridge. They were worked ("operated") by water-wheels. In the next sentence it is stated that in 1819 the New River Company was incorporated and laid its pipes throughout the City. It is not correct to say that the New River Company laid pipes throughout the City in that year. At that time the extension of the supply of the company was made from time to time as new customers were obtained. In the next sentence it is stated that "it"—that is to say, the New River Company—"received its supply from the New River." This is true. The authors, however, do not appear to know that the New River was a conduit made for the express purpose of conveying water from Amwell and Chadwell, two Hertfordshire springs, to London. The book is well printed, but the spelling differs from that adopted in this country.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

AN ordinary meeting of the Comitia was held on July 25th, Sir W. S. CHURCH, Bart., the President, being in the chair.

The following gentlemen having passed the required examination were admitted as Members: Thomas Bushby, M.B. Edin.; Arthur Henry Weiss Clemow, M.D. Edin.; John Cecil Mackmurdo Given, M.D. Lond.; Thomas Wardrop Griffith, M.D. Aberd.; Arthur Douglas Heath, M.D. Lond., L.R.C.P.; Thomas McCrae, M.B. Toronto, L.R.C.P.; Frederick Craven Moore, M.D. Vict.; and Harold Douglas Singer, M.D. Lond., L.R.C.P.

Licences to practise were granted to 112 gentlemen who had duly satisfied the examiners, and Diplomas in Public Health were granted, conjointly with the Royal College of Surgeons of England, to 24 gentlemen.

William Joseph Tyson, M.D. Durh., elected April 25th, was admitted to the Fellowship.

The following communications were received:—1. From the secretary of the Royal College of Surgeons of England reporting certain proceedings of the Council on July 11th. 2. From Dr. F. Womack, lecturer on physics at St. Bartholomew's Hospital, suggesting some amendments in the Syllabus of Physics for the first examination.

The PRESIDENT announced that Dr. Norman Moore had been selected as Harveian Orator.

A report was received from the Council in regard to the desirability of the representatives of the College on the Senate of the University being *ex-officio* members of Council, making the following recommendations:—1. That of the two representatives of the College on the Senate of the University of London one be *ex-officio* a member of Council. 2. That each representative serve alternately as a member of Council for a term of two years or for such shorter term as he may remain a representative; and that in the first instance, of the two representatives the senior Fellow be the one to serve.

On the recommendation of the Council the Baly Medal was awarded to Frederick William Pavy, M.D. Lond., F.R.S., F.R.C.P., for his researches on "The Physiology of the Carbohydrates: their Application as Food, and Relation to Diabetes," 1894, but more especially for his original investigations on Sugar Formation in the Liver, which he has carried on during the last 40 years and with unabated enthusiasm during the last two years.

Reports were also received: (1) from the representative of the College in the General Medical Council on the proceedings of that Council during its session in May last; (2) from the Committee of Management; (3) from the Conjoint Finance Committee; (4) the quarterly report of the College Finance

Committee; (5) the annual report of the Library Committee; and (6) the annual report of the curators of the museum.

The REGISTRAR moved that the by-laws in conformity with the revised regulations of the Conjoint Board, adopted May 9th, 1901, be re-enacted for the second time. Books and other publications presented to the library during the past quarter were received and thanks returned to the donors.

The following is a list of the Censors and other officers nominated by the President and Council and elected for the ensuing year 1901:—Censors: Dr. Thomas Tillyer Whipham, Sir Dyce Duckworth, Dr. Thomas Henry Green, and Dr. George Vivian Poore. Treasurer: Sir Dyce Duckworth. Emeritus Registrar: Sir Henry Alfred Pitman. Registrar: Dr. Edward Liveing. Harveian Librarian: Dr. Joseph Frank Payne. Elected Members of the Library Committee: Dr. Samuel Gee, Dr. John Wickham Legg, Dr. Norman Moore, and Dr. William Henry Allchin. Curators of the Museum: Dr. William Howship Dickinson, Dr. Henry Charlton Bastian, Dr. William Cayley, and Dr. John Abercrombie. Finance Committee: Dr. Thomas Tillyer Whipham, Dr. Alfred Lewis Galabin, and Dr. Stephen Mackenzie.

EPSOM COLLEGE: FOUNDER'S DAY.

THERE was, as usual, a large and representative assembly of members of the medical profession at Epsom College on July 27th, when Founder's Day was celebrated, the annual distribution of prizes being also associated with the celebration. The proceedings commenced with a thanksgiving service in the chapel, after which the visitors adjourned to the big schoolroom. The head-master, the Rev. T. N. Hart Smith, presided, and was supported on the platform by the chairman of the council, Sir Joseph Fayrer, Sir Herbert Maxwell, M.P., Dr. C. Holman (treasurer), Colonel Gordon Watson, son-in-law of the founder, and the members of the school staff. The head-master having welcomed the visitors referred to the death of the late Queen and mentioned that she had been a patron of the institution ever since it was founded and had always taken a great interest in it. Her loss was irreparable, but it was a great consolation, and he would like to have the pleasure of announcing it that day, that the King had kindly consented to take her place and become the patron. His Majesty was present at the opening of the college; he visited it five or six years ago, when the foundation-stones of the lower school were laid; and he had added to his kindness by becoming their patron and continuing his interest in it in that way. He never remembered more entries than they had had that summer term, and certainly, so far as examinations were a test of success, they had never had a more successful time than during the last 12 months. He hoped that this year the result might be improved upon because they had entered no less than 58 boys. Referring to Lord Rosebery's speech at the recent festival dinner he observed that a great many of them sympathised with his lordship's allusion to the rather long adjectives with which their title was burdened. He thought they would be very much amused if he were to tell them some of the results of one of those adjectives. He was often asked by anxious parents if he would train their son, who was going to become a doctor, in anatomy, materia medica, or put him through his bones. Sometimes he received advertisements of strange appliances or gruesome drugs, but what gave him more satisfaction, perhaps, than anything else was to be addressed as the dean of the medical school.—The prizes were then presented.

Sir HERBERT MAXWELL, M.P., afterwards addressed the assembly and in the course of his remarks observed that he had a hobby and that hobby was natural history. He noticed that amongst the prizes was one given for proficiency in that science and he was glad to see that it had its place amongst their studies. But his satisfaction was somewhat damped when he found that that prize was awarded, not for reports of successful research, but for competition collections. He was aware of his boldness in making that criticism, but he would not be quite sincere if he concealed from them the regret that he had that natural science seemed inseparable from competition and from the destruction of the very creatures which naturalists ought most to admire, to revere, and to protect. What did a competitive collection imply—a collection of butterflies, a collection of birds' eggs, a collection of dried plants? Did it not mean the destruction of the specimens, and that those specimens were valued just in proportion to their rarity? They were a populous nation, and as man increased the humbler animals, the humbler organisms, were apt to decrease. Let natural history and that love of open-air pursuits be increased to the utmost—nothing but good could come of them; but would it not be possible, he asked, rather than to bestow prizes upon successful collectors to offer them to stimulate the industry and penetration of careful observers? It seemed to him that the difference between the love of excelling and the love of excellence was the difference between the mere collector, the competitive collector, and the student of nature who loved nature and all its works for their own sakes.

The usual votes of thanks concluded the proceedings.

ASYLUM REPORTS.

Worcester County and City Asylum (Annual Report for 1900).—The average number of patients resident during the year was 1144 and comprised 516 males and 628 females. During the year 247 patients were admitted, 129 being males and 118 being females. Of these 31 were not first admissions. Mr. G. M. P. Braine-Hartnell, the medical superintendent, states in his report that among the admissions there were 160 patients in indifferent health and reduced condition and 69 patients in bad health and exhausted condition. One male patient was admitted suffering from pneumonia which caused his death in four days, and two patients (one male and one female) were admitted with recently-cut throats, both recovering in a few days. During the year 77 patients were discharged as recovered, or 6·7 per cent. of the average number resident. The deaths during the year amounted to 128—viz., 57 males and 71 females—or 11·18 per cent. as calculated on the same basis. 30 per cent. of the deaths were in patients of 70 years of age and upwards. General paralysis was responsible for 17 deaths, pneumonia for 26, and phthisis for 26. These three diseases caused more than half of the total deaths. Post-mortem examinations were made in 110 cases of death. A married woman admitted while pregnant was confined of a daughter. The patient died soon afterwards from pneumonia. An inquest was held on the body of a female patient who had escaped and drowned herself in the reservoir. The jury returned a verdict of "suicide by drowning," and added "that no blame attached to anyone connected with the asylum." This is the first case of suicide which has occurred in the asylum since 1883. Four male patients escaped from the asylum. One was recaptured in four hours and another in three days. Two remained at large and at the expiration of the statutory period were regarded as discharged. Colitis or dysentery still prevailed, being associated partly with overcrowding and partly with feeble health. Two male attendants were called out to join the army in South Africa. Their places are kept open for them in view of their return. Two male attendants were dismissed for striking patients and were prosecuted by the committee. They were each fined 40*s.* and costs. With these exceptions the conduct of the staff has been satisfactory. The average weekly cost per patient for the year was 8*s.* 0½*d.* This is 2¾*d.* more than last year, and the increased price of coal is responsible for this. The profit on the farm amounted to £538 8*s.* 0*d.* "In view of the constant recurrence of infectious disease a good disinfector is urgently needed. The present means of disinfection are antiquated and inadequate and a source of anxiety." The Commissioners in Lunacy state in their report that the wards were bright and cheerful, the dormitories were in good order, and the bedding was very clean. The case-books and other medical records were carefully and intelligently kept. In view of the overcrowding of the asylum a site for a new building has been obtained near Bromsgrove, and the Commissioners recommend that rooms should be arranged in it for idiot children apart from insane adults.

THE LANCET.

LONDON: SATURDAY, AUGUST 3, 1901.

The British Medical Association: The Address in Medicine.

DR. J. F. GOODHART took for his subject the difficulties encountered in the daily practice of medicine, and seldom have we listened to a more eloquent discourse. The first difficulties with which Dr. GOODHART dealt emanate from the patient. In spite of the enormous advances made by medicine and surgery it cannot be said that drugs are less used or operations less frequent. The reason for this lack of diminution of medical treatment is to be attributed to the increased sensitiveness about health displayed by civilised peoples. This has necessarily its good side, and so far as it leads to increased care in the prevention of disease or to greater appreciation of early treatment in serious maladies, it works for good; but the patient is daily becoming more sensitive to many minor ailments which would right themselves without any aid from the pharmacopœia. The patient also wants to know too much, and will have a name for his ailment, even though the name alone can tell him nothing. Should his medical man be unable to give an exact diagnosis it is taken as a proof of ignorance and a practitioner who is more rapid at naming the disorder is called in. Yet there are no departments of medicine where hesitation is so great a proof of knowledge as in diagnosis. It is true that wide knowledge may recognise at once conditions which have puzzled those less learned, but it is also true that he who knows much may hesitate long in coming to a conclusion, while he whose knowledge is limited, having fewer matters among which to choose, hastily makes a diagnosis. Yet this is quite unappreciated by the average patient who estimates the value of an opinion by the certainty with which it is expressed. Dr. GOODHART showed also the mistaken notion that too many patients have of the nature of a consultation—viz., that the second opinion is sought to set the first right; even though the second opinion serves in probably a majority of cases to confirm the diagnosis already given, for nowadays the general high level of medical education makes it rare indeed for any great error to occur. The knowledge of the laity of the names and uses of drugs is not extensive, but yet deserves to be considered of that degree which is dangerous; for the patient with a little therapeutical learning tries all the new preparations on himself, and only when he has tried them in vain does he condescend to consult a medical man.

The patient, however, is not alone to blame for much that is unsatisfactory in the practice of medicine: the medical man himself is responsible for no small part of the attitude of the laity, and Dr. GOODHART does not spare the profession. We are too ready, he told us, to detect disease, for we do not appreciate how wide are the limits of health, how many deviations from what we call the normal are compatible with a good state of health. The two organs with which the statement of this fact was illustrated were the heart and the stomach. The heart is often said to be weak and its owner is cautioned against exertion, and in consequence he leads a useless, indolent life, when the heart would have been all the better for a reasonable amount of work. Indeed it may well be that lack of work may impair the vitality of a heart which but for excessive care would have lasted many years and performed its duties well. The stomach, too, is often needlessly maligned. Catarrh and dilatation are frequently said to be present on insufficient grounds and unnecessary treatment is prescribed for what has never existed. Excessive mobility of the abdominal viscera is often diagnosed nowadays and various stitching operations are recommended. Not rarely the demand for the operation comes from the patient, who knows, or has heard of, someone else on whom it has been performed, and there is often great difficulty in persuading such an one that no operation is needed. And if the patient has a liking for an operation he has a still greater relish for drugs, of which he can consume an enormous quantity. No treatment is thought to be complete unless a prescription is given, and it is, perhaps, because of the universal presence of drugs in some form or other in every case that the laity have got the idea into their minds that the drug is the essential part of the treatment and that the advice as to diet and habits is merely a customary addition of very little importance. The advice may be priceless, yet if it is unaccompanied by the prescription it is thought to be of very little value.

Dr. GOODHART had a word to say on fashion in drugs, and it must be confessed with humility that there is a fashion in drugs which is comparable with nothing so much as with fashion in dress. Drugs which but yesterday were extensively used are to-day almost forgotten. The antipyretics which were prescribed so freely 15 years ago are hardly ever given now for their effect on temperature, though the more important members of the group are given still, but for entirely different reasons. The drugs which at the present moment appear to be at the height of their popularity are animal extracts and antitoxins, yet the discerning eye may even now perceive that many of them have passed their zenith and ere long will be forgotten, or at most will be employed only in rare and isolated cases. There is much excuse to be made for the mental attitude of extreme hopefulness with which we receive each new medicament, for there are still so many diseases and symptoms appealing for help and we have to acknowledge that we can do but little for them. Yet it would be well if we adopted a more cautious attitude in receiving new drugs and new methods of treatment; they deserve to be tried and to be tried thoroughly, but we must not expect too much and must sift carefully the evidence for and against them. When we have tried and proved the value of any treatment let us hold fast to it and not too hastily throw it aside for some more novel, yet possibly less useful, method. In the hands of the medical man rests the power of educating the public mind to appreciate the value of medical advice and the less importance of drugs.

If the medical profession insists strongly on this their patients will in time come to put a higher value on the medical advice of which at present they think but little.

The British Medical Association: The Address in Surgery.

THE surgical lessons of the campaign in South Africa formed the subject of Sir WILLIAM THOMSON'S Address in Surgery. Many of these lessons have been much taken to heart by the medical profession, as they were learned from the communications to our columns and those of the *British Medical Journal*, but the teachings of the war will bear recapitulation, for South African experiences have had a revolutionary effect on the tenets of military surgery. Moreover, Sir WILLIAM THOMSON made his points with great clearness, speaking with the authority of first-hand knowledge. The conditions were novel under which that campaign was fought, so that it was difficult to foretell exactly what surgical lesions would be met with. The chief changes in the conditions were the smaller size of the bullet, its greatly increased velocity, and its inclosure in a smooth nickel casing. Experiments made beforehand, and a few accidents, enabled surgeons to have some idea as to the results which would be likely to follow, but all the experiments were on dead bodies, chiefly of cattle, and dead tissues do not react to the passage of a bullet in the same manner as living tissues react. The experiences of the Cuban War, fought under somewhat similar conditions, were hardly available, for very little had been published either by American or Spanish authorities at the time when hostilities commenced at the Cape.

There are two main points which have to be considered before the probable damage inflicted by modern high velocity bullets can be estimated:—firstly, the distance at which the rifle is discharged, and, secondly, whether or not the bullet meets with a bone in its passage through the tissues. If the rifle is fired within 200 yards the destruction produced is very great indeed, even if no bone be broken, but the vast majority of the shots were fired at a much greater distance than this and these severe results were rare. When the bullet encounters no bone in its passage through the tissues it is marvellous how very slight may be the disturbance. A minute aperture of entry is made, decidedly less than the size of the bullet, and the aperture of exit can be barely distinguished from it. So smooth, so polished, is the surface of the projectile that it makes its way among the structures more by pushing them aside than by tearing through them, so that after the bullet has passed the displaced tissues fall back naturally into position and no channel is left. Therefore, if no septic organisms have gained admittance the parts are in the most perfect order for the occurrence of rapid healing. It might be thought that the tissues displaced by the bullet were severely damaged and prone to slough, but a case in which the cartilages of the nose were perforated showed that a mere fragment of tissue nearly cut off from all its vascular connexions by the bullet may survive. Whether the projectile were aseptic or not it is certain that many gunshot wounds healed by first intention. This does not, of course, prove that they were absolutely aseptic, but it proves that very few organisms can have been present—no more than the tissues could deal with. The early application of the first dressing Sir WILLIAM THOMSON considers to have been a factor of great importance in the rapid healing of wounds. This first dressing was often applied by the wounded man himself and therefore morbid germs had but little chance of entering, except when they were carried in by the bullet. Another cause of great moment in the healing of the wounds was the dry atmosphere, by which any blood or other exudation quickly dried into a scab; this condition of the atmosphere was doubtlessly in great part due to the elevation of 4000 feet or more which characterised a large portion of the seat of war. All the conditions for the healing of the less severe wounds could hardly have been more favourable.

Even when the bullet traversed the abdomen the injury done was wonderfully small. It appears to be proved that a Mauser bullet can pass between coils of bowel without wounding them, for one case was met with by Mr. CHEATLE in which the bullet passed through the cæcum and sigmoid flexure without wounding the intervening small intestine. Other cases, however, have been recorded in which, after the passage of a bullet through the abdomen, blood in the motions proved conclusively that the bowel had been wounded. Yet even in some of these cases an uneventful recovery followed without any operative interference. This Sir WILLIAM THOMSON considers was due to the angle of impact being nearly 90 degrees. The inducements, therefore, to perform primary laparotomies were not great when so many cases of perforating abdominal wounds recovered without operation, and the want of facilities for abdominal surgery made it very inadvisable to perform abdominal section except in a small minority of cases. Even where perforation and extravasation have obviously occurred it is generally not possible to operate, for the elaborate procedures and the aseptic conditions necessary for the successful performance of a laparotomy are not to be found in most field hospitals and probably will not be found for many years.

The greatest difference, however, between the injury inflicted by the older, large, soft, slowly travelling bullets and the modern small, hard, and rapid projectiles is to be found in the injury sustained by the bones. When a modern small-bore bullet meets the shaft of a long bone it comminutes the bone, and many of the fragments are carried some distance in the direction in which the bullet was travelling. These fragments tend to cause extensive destruction of the soft parts. If the velocity of the projectile is less the injury to the bone is slighter and may cause only a single fracture. When, however, cancellous bone is encountered by the bullet a clear perforation of the bone not infrequently results. The statistics of the American Civil War demonstrate conclusively the very large proportion of cases in which bones are broken in warfare; nearly 25 per cent. of the wounded in the Northern hospitals suffered from fractures. Formerly the mortality was appalling, and the benefit resulting from amputation in gunshot fractures of the limb-bones was very problematical, for after amputation of the thigh in the Crimean War 73 per cent. died, and in the Franco-German War among the French

wounded the mortality reached 90 per cent. The treatment of these cases without amputation was able to show somewhat better results even in the earlier wars, and in the Franco-German War the difference was marked. In the recent fighting in Cuba the general mortality of all cases of compound fractures of the thigh was under 11 per cent. In the South African campaign general numerical results are not yet attainable, but Sir WILLIAM THOMSON tells us that amputation was quite exceptional and only performed when the case was otherwise hopeless, yet the total mortality was exceedingly small. Wounds of joints also have done well. The old teaching was that whenever the knee-joint was penetrated by a bullet, whether the bone was fractured or not, the limb should be amputated, and this doctrine was supported by the experience of the Crimean War and the American War. Yet in the present war the cases did extremely well without amputation; most of them pursued an aseptic course, and by careful occlusion of the openings and keeping the limb at rest, recovery, and in many cases early restoration of normal movement, followed.

The South African War has demonstrated the urgent importance of not exploring wounds on the field of battle, or, indeed, at any time, unless there is a distinct indication for it. It has shown that elaborate operations are not possible with the present arrangements, at least in field hospitals, neither are they needed in many injuries in which formerly they were considered absolutely necessary. The slighter injuries heal readily, simply, and as a rule aseptically, with almost a minimum of treatment. What changes in military weapons time may bring we cannot say, but there has never been a war before in which so large a percentage of the wounded recovered. Possibly in the future this proportion may increase, but even as it is many more died in war from disease than from wounds.

The Complimentary Dinner to Surgeon-General J. Jameson, C.B.

WE gave last week a brief report of the proceedings at the complimentary dinner given to Surgeon-General JAMESON, C.B., the late Director-General of the Army Medical Service, at the Hotel Cecil on July 24th. But the occasion was one of unusual interest and of notable character, and warrants us in returning to the subject. Sir WILLIAM CHURCH, who presided, was a member of the South African Hospitals Commission, and had had the fullest opportunity of forming an independent opinion as to the nature and extent of the provisions made for the campaign and of the services rendered by the Army Medical Service. Also he had personally inspected the war hospitals and ascertained for himself their condition, the work they had performed in the field, and the difficulties that had to be overcome. It was fitting, therefore, that he should occupy the position he did when a great gathering of the medical profession assembled "from a desire to do honour to one who had deserved well both of his profession and of his country." Sir WILLIAM CHURCH declared that the war was a perfectly unique war, unprecedented in its character, and that the labours of the then Director-General, who had been like the Israelites called upon to make bricks without straw, had been enormous. The success of the organisation of the hospital service in South Africa was largely due to the rapidity and continuity with which Surgeon-General JAMESON was able to supply the *matériel* and *personnel*. The constancy with which he had stuck to his post and work and the exceedingly able manner in which he had kept up a good relationship between his own corps and their civilian brethren were striking and gratifying features in the late Director-General's administration to which Sir WILLIAM CHURCH called proper attention.

Surgeon-General JAMESON, in replying, was listened to with marked attention and his speech in vindication of the Army Medical Service throughout the South African campaign made a great impression; and it well deserved to do so, for it was dignified and admirable in tone throughout. The story of his department, as he told it, was a most creditable one to all concerned. His speech mainly consisted of well-arranged and lucidly expressed statements of fact of a very pertinent kind. Readers of THE LANCET are pretty well acquainted with the medical history of the war, but Surgeon-General JAMESON from his official position was enabled to speak with a knowledge and precision which others have not done, and to furnish many details and figures which were not hitherto attainable. Everybody has long known that neither the Government nor the military authorities had any real idea of the magnitude and formidable nature of the task which they were undertaking. The force considered sufficient and sent out in the earlier months of the war well-nigh exhausted the available medical establishment; yet troops poured into South Africa until the field force was soon increased threefold. Notwithstanding that the strain on the medical service was enormous it was met. The efforts of the Director-General and his colleagues were ably seconded, as he told his audience, by the nation, the colonies, the civil medical profession, and various volunteer societies, and medical and hospital requirements were provided. As an indication of the work that fell upon the Army Medical Service Surgeon-General JAMESON mentioned that 50,000 invalids had been received from South Africa, India, and the colonies since the beginning of the war, none of whom were transferred to civil hospitals; while there are 21,000 beds equipped at the present time in South Africa without counting the field hospitals. He pointed out that the post of sanitary officer had been abolished against the advice of his department and among many other points he made a remark the significance and importance of which will be at once recognised by all military men, and should not be lost sight of in connexion with the occurrences at Bloemfontein. "After the entry into Bloemfontein, when you hear," said Surgeon-General JAMESON, "that for 10 days there was no officer of the ordnance department present, if there is any blame it should not be put to the medical department." The hospital service has, of course, to depend entirely upon the army supply departments.

Surgeon-General JAMESON's words also threw light upon the relations of himself and his service to the Government and the War Office and military authorities. Are we likely with the best medical officers in the world to have a really good and efficient medical service so long as it can

he affirmed that the head of it has not access to the Secretary of State for War, is not a member of the War Office Council over which the Secretary of State presides, or of the Army Board presided over by the Commander-in-chief? Surgeon-General JAMESON said that "it had happened that matters relating to his department had been discussed in his absence and he had not known of the decisions till after considerable delay." If the head of an important service can be treated thus what wonder if recruits to the service are hard to come by. Surgeon-General JAMESON might very truthfully and consistently remark in respect of the present war that the officers of his service did not think that justice had been done to them, and we deeply regret that some army medical officer of rank and administrative experience should not have been nominated as a member of the War Office Committee now sitting.

To one other point we wish to make reference. Sir WILLIAM MAC CORMAC, in proposing the toast of "The Public Medical Services," made the following reference to the omission of the bestowal of titular honour on Surgeon-General JAMESON: "No one," he said, "who had not been in the country itself could know of the difficulties under which the medical department had laboured. They had been blamed for that for which those in other departments were responsible, and it was somewhat strange that the Government had allowed Surgeon-General JAMESON to leave the army without the customary recognition given to every one of his predecessors and without one word of thanks or acknowledgment." The medical profession cannot but feel that this is not the way to treat a very able officer who has rendered conspicuous service to the nation and who was the head of a large and important branch of the army. And not only the medical profession, but the public, know that justice has not been done.

The Results of the British Congress on Tuberculosis.

As with battles so with congresses. There is much smoke or much talk, and only when these have cleared away is the issue apparent. That the Congress, as a congress, was a decided success no one who attended it can doubt. The proceedings were instrumental in eliciting the sympathy and support of a large number of leading men, and the gracious message of His Majesty the KING to the opening ceremony, as well as his reception accorded to the foreign delegates, sufficed to show that the Crown sympathises to the full with the efforts of preventive medicine.

The event of the Congress was undoubtedly the address of Professor KOCH, in which he threw doubt upon the communicability of tuberculosis from animals to man, and it is more than probable that his words will be responsible, as we predicted last week, for the appointment of a third Royal Commission upon Tuberculosis. It must, however, be said that the situation has become markedly modified since that address was delivered. The courteous but trenchant criticism of Lord LISTER and the testimony of Professor BANG, Professor NOCARD, and Professor G. SIMS WOODHEAD, as well as the lucid address by Professor J. MCFADYEAN, have gone far to show that in the opinion of comparative pathologists there are at least other sides to the question. Lord DERBY and Lord SPENCER have as administrators seen the need for caution, while that prince of pathologists, VIRCHOW, has given it to be understood that the last word has not yet been spoken. In this particular aspect, then, the outcome of the Congress cannot be predicted. We may have to wait for the report of a Royal Commission before we are in a position to judge whether Professor KOCH's statement was justified by the facts or not.

Professor BROUARDEL's address, although it did not contain a passage of such a sensational character as Professor KOCH's pronouncement upon bovine tuberculosis, was full of useful information and of encouragement with regard to the utility of preventive measures. The address probably hit the mark when it attributed the decline of pulmonary tuberculosis in this country largely to the better housing of the poor and to the generally improved condition of the labouring classes. There is more to support this thesis than there is that of Professor KOCH to the effect that such decline is due to the erection of hospitals for consumption in this country. We fear that Professor KOCH must have been misinformed as to the number of such institutions and as to the preventive measures which they have, until quite recently, been instrumental in inculcating. Professor BROUARDEL showed what a large amount of work in the direction of popular education as regards the prevention of phthisis is being performed by many nations of the earth, and the valuable part which anti-tuberculous associations and dispensaries are exercising in this direction. With respect to alcoholism Professor BROUARDEL had some very pregnant words to utter, and quoting the words of Sir JOHN SIMON that "the wretched lodging is the purveyor of the public-house," he added "that the public-house is the purveyor of tuberculosis," illustrating his arguments by reference to Dr. TATHAM's figures. With Chancellors of Exchequers generally Professor BROUARDEL has little sympathy. "They," he remarked, "like to calculate the sum the State get from the duty on alcohol, but they should deduct from it the cost to the community of the family of the ruined drunkard, his degenerate, infirm, scrofulous, and epileptic children who must have shelter." This is sound political economy as well as Christian teaching.

On the last day of the Congress its work was crystallised into a series of resolutions, some of which should have considerable influence in the right direction if adequate and immediate use is made of them. It has to be remembered that several of these resolutions were passed in the State Section where there were present, in addition to a very large number of medical officers of health, Members of Parliament and members of county and district councils. These public workers must see to it that the resolutions which they unanimously passed receive their share of attention when they come, as we take it they will, before the several bodies referred to. The desirability of the notification of pulmonary phthisis attended with tuberculous expectoration was unanimously supported by the State Section; indeed, there were some who wished to make such notification compulsory, and among these were some of our American *confrères* who added so much valuable material to the discussion upon this subject. An expression of opinion such as this cannot fail to have an influence upon the attitude of the Local Government

Board upon this matter. So, too, the expression of opinion that the provision of sanatoria is an indispensable part of the measures necessary for the diminution of consumption will determine the conduct of public bodies who have hitherto been in doubt as to what course they should adopt. The formation of an International Committee to study the behaviour of pulmonary tuberculosis is likely to be attended with useful result, and such a committee might very well take action in respect of steamboats, railway trains, and stations. When we succeed in procuring a uniform system of registration in the several countries we shall have made a great stride towards a proper system of international epidemiology. The other resolutions had concern mainly with the enforcement of home truths, and if these resolutions are made proper use of good results should follow. Among these resolutions there is one which we should like to see thoroughly digested by all local sanitary authorities, not only in this country, but in every other. It was as follows:—

"*That, in the opinion of this Congress, overcrowding, defective ventilation, damp, and general insanitary conditions in the houses of the working classes diminish the chance of curing consumption and aid in predisposing to and spreading the disease.*"

The last resolution of the Congress was proposed by our guest, Professor BROUARDEL, and seconded by Professor CALMETTE of the Pasteur Institute of Lille, and it was to the effect—

That while recognising the great importance of sanatoria in combating tuberculosis in every country, the attention of Governments should be directed towards informing charitable and philanthropic individuals and societies of the necessity for anti-tuberculous dispensaries as the best means of checking tuberculous disease amongst the industrial and indigent classes.

Such dispensaries should, Professor CALMETTE thinks, *precede* and *complete* the foundation of sanatoria, while the enormous amount of good that may be done by them could not have had a more eloquent exponent than Professor CALMETTE.

Looking at the British Congress of Tuberculosis as a whole it seems to us that it has been instrumental in bringing together a large number of workers in the field of preventive medicine both in this country and abroad, and that this act has been attended with a useful exchange of ideas and with a quickening of the public conscience in the matter of State medicine generally and of the prevention of tuberculosis in particular.

Annotations.

"Ne quid nimis."

METROPOLITAN HOSPITAL SUNDAY FUND.

AT a council meeting of the Metropolitan Hospital Sunday Fund, over which the Lord Mayor presided at the Mansion House on July 30th, it was announced that the Committee of Distribution had recommended awards for the present year to 196 institutions. The amount of collections, including interest from the Chancery Division of the High Court, to the present time is £51,000, this sum including £4000 sent by Sir Frederick Cook, M.P., with a request that it might be divided equally between the London Hospital, Guy's Hospital, St. Thomas's Hospital, and St. George's Hospital. That course will be adopted and the money paid to these four hospitals, together with the amount of the award recommended by the committee when confirmed by the council. The committee anticipated a further £1500 before the accounts were closed on Oct. 31st. The distribution of £44,534 to 142 hospitals, &c., and to 54 dispensaries was recommended. This year 200 institutions had made applications for grants from the Fund. Of that number it was found necessary to invite the attendance of deputations from the governing bodies of 18. The committee were not able to recommend any awards to two dispensaries and one convalescent home. Deputations from six hospitals and three dispensaries conferred with the committee. The remaining nine replied by letter, leaving the matter in their hands. Explanations modifying the causes of adverse criticism were given in four cases. The serious dissensions between the medical staff and the Board of Management at the National Hospital for the Paralysed and Epileptic, Queen-square, had recently been investigated by a committee of inquiry, the report of which had been followed by the resignation of the secretary-director, and a decision by the governors of the hospital to admit two of the staff to the Board of Management. If that restored harmony between the staff and the board the Distribution Committee would at once report to the council with reference to awards to the National Hospital for the years 1900 and 1901. Five per cent. of the total sum collected—viz., about £2500—was set apart to purchase surgical appliances in monthly proportions during the ensuing year. Mr. George Herring had again most liberally sent a further donation of £10,000. The collections on Hospital Sunday were generally well maintained and showed the confidence that the public had in the Fund. The report was unanimously adopted on the motion of Sir Sydney Waterlow who in the course of his speech asked that a grant to the Royal Eye Hospital might be temporarily withheld pending the investigation of a complaint by the London School Board with regard to the treatment of certain children suffering from ophthalmia. It was also decided that last year's award, together with that for the present year, should be forthwith paid to the National Hospital for the Paralysed and Epileptic.

THE CEREBRAL LOCALISATION OF MELANCHOLIA.

IN a paper which appears in the *Journal of Mental Science* for July Dr. Bernard Hollander makes an attempt to determine the precise area of the brain which is affected in melancholia. Jensen and Tigges had found that the frontal lobes do not show atrophy or loss of weight in melancholia, and hence Dr. Hollander begins by looking for its site in other parts of the brain. Starting from the premise that in melancholia a limited area of the brain is involved because the disease is assumed to be a "morbid condition of the emotional life, affecting an area which is not concerned in intellectual processes," the conclusion is reached that this area is situated in the parietal lobe "particularly the *angular and supra-marginal gyri*." At any rate, the disease is regarded as having its starting-point and as being most intense in these convolutions. It is claimed that in cases of cranial injury involving the parietal eminence and the underlying convolutions—viz., the angular and supra-marginal, as distinguished from other parts of the brain—melancholia is likely to follow. A characteristic case of this was that of a man, aged 28 years who at the age of 17 years fell from a carthorse and sustained an injury of the right parietal bone (its lower portion) in the form of a depression from a thrust received by the pole of the cart. He was carried home unconscious. The scalp-wound healed readily but a depression of the skull remained.

Striking mental changes followed. "Patient shunned all association with men, sat for hours brooding in a corner, had daily paroxysms of weeping," and took to bed. He was irritable and would not obey his parents. Dr. Stetter, who was consulted, decided to trephine and the depressed bone was removed. "After the operation the patient returned to social life again and became quite normal."[1] Another case, one of cerebral tumour (cyst) with melancholia was described by Bernhardt[2] as "an extraordinary pathological condition of the brain." The patient was a woman, aged 63 years, who for years had suffered from melancholia with paroxysms of anxiety which increased in intensity so that she made several suicidal attempts. She developed also various hypochondriacal delusions. At the necropsy a cyst was found pressing on the left parietal lobe beneath the dura mater and adherent to it. It produced depression of the greater part of the parietal lobe for about two centimetres below its level. The cyst was of about the size of a hen's egg and filled with serum. There were no entozoic remains in the cyst. Several cases of symmetrical atrophy, or thinning of the parietal bones, are known in association with melancholia. In one of these, reported by Rudolf Bloch, a woman, aged 86 years, was the subject of melancholia and of symmetrical thinnings of the parietal bone, the areas affected by the thinning being 45 millimetres in diameter on the right side and 40 millimetres on the left side. There was a suicidal history in the family. Thirty years previously she had been in an asylum for melancholia and had made several suicidal attempts. The external table and the diploë of the bones were rarefied and thinned out, the bone here being practically reduced to inner table only. In 1854, at a medical meeting in Würzburg, Virchow showed the skull of a man whose chief symptoms were pain, giddiness, and intense melancholy, "and whose facial expression had been observed to be always one of supreme sadness." On both parietal bones, exactly corresponding to the eminences, the bone was so thin as to be perfectly translucent when held against the light. In several cases cited there was a coexistence of "word-blindness" with melancholia, especially in lesions of the left side of the brain. Dr. Hollander attempts to give a rational explanation of these facts by stating that the "emotion of fear" is located in the parietal lobe (central part), and that its lesions produce psychical disturbances allied to melancholia.

[1] Centralblatt für Chirurgie, 1892.
[2] Allgemeine Zeitschrift für Psychiatrie, 1883.

THE BRITISH DENTAL ASSOCIATION.

THE annual general meeting of the British Dental Association will be held in the Examination Hall of the Royal Colleges of Physicians of London and Surgeons of England, Victoria Embankment, from August 2nd to 6th. The proceedings will commence with a reception and entertainment by the Metropolitan Branch of the Association at the Hotel Cecil on Friday, August 2nd, at 8.45 P.M. On August 3rd the first general meeting (members only) will be held at 10.15 A.M. in the theatre of the Examination Hall. At 12.15 P.M. visitors will be admitted and the President's address will be delivered. The second general meeting will be held at 2.30 P.M. From 5 P.M. to 6.30 P.M. there will be a reception by the dean and medical staff of members, ladies, and foreign visitors at the new Dental Hospital, Leicester-square. At 8.30 P.M. there will be a reception by the President-elect and Mrs. Hutchinson at the University of London, Imperial Institute-road, South Kensington. On Monday, August 5th, the second general meeting will be held at 10 A.M. At 12.30 P.M. Mr. J. Leon Williams, President-elect of the Microscopical Section, will deliver an address on the Use of the Microscope in Dentistry. At 7 P.M. the annual banquet of the Association will be held at the Hotel Cecil. It is understood that Mr. H. G. Howse, President of the Royal College of Surgeons of England, Sir James Crichton Browne, Mr. Christopher Heath, and Mr. James Smith Turner will be among the speakers. The fourth general meeting will be held on August 6th. The museum will be open daily from 9 A.M. to 5 P.M.

THE NECESSITY FOR INCREASING THE DOSE OF ANTITOXIN IN CERTAIN CASES OF DIPHTHERIA.

AFTER the injection of antitoxin in diphtheria recovery is usually rapid; the general symptoms diminish and the membrane ceases to extend and becomes detached. But in certain cases improvement does not follow and the disease progresses to a fatal termination. This result has been attributed to using antitoxin too late, to associated infections, or to special malignity of the disease. No doubt these are important causes, but there are cases in which the disease progresses because the dose of antitoxin is insufficient and is determined simply by the age of the patient when the gravity of the symptoms necessitates a large dose and its repetition until they regress. At the meeting of the Société Médicale des Hôpitaux of Paris on June 14th, Dr. H. Barbier and Dr. M. F. Lobligeois communicated an important paper on this subject based on cases which they observed in the Hôpital Trousseau in the months of January, February, and March, during an epidemic of diphtheria in Paris of special severity. In some of the cases the symptoms, local and general, did not become worse, but they did not improve. The antitoxin seemed to have simply arrested the progress of the disease. To this form Dr. Barbier and Dr. Lobligeois give the name "prolonged diphtheria." In other cases the symptoms improved and the membrane became detached, then after a variable time the membrane and the toxic symptoms reappeared ("relapsing diphtheria"). The relapses sometimes occurred before the membrane of the first attack had separated, sometimes after it had disappeared, the throat having remained clear for a longer or shorter time. These prolonged and relapsing forms of diphtheria were observed with special frequency in the epidemic referred to and previously in isolated cases. Of 325 cases the membrane persisted in 50 after the third day following the injection. In two the throat was not entirely clear until the twelfth day. The ages of these children varied from 18 months to six and a half years. The dose of antitoxin given on admission varied from 10 to 40 cubic centimetres, usually it was 20 cubic centimetres. The quantity was based on the apparent gravity of the case rather than on the age of the patients. There were 27 cases of "pure diphtheria" to 19 of "associated diphtheria." In most cases a second injection of 10 cubic centimetres given on the second or third day after admission caused the separation of the membrane, sometimes a third and even a fourth injection was necessary. The total quantity of antitoxin given was usually about 40 cubic centimetres. In some cases the dose was increased and from 90 to 140 cubic centimetres were given. In 15 cases the membrane having entirely disappeared, after the injection of antitoxin, which had sometimes been repeated, reappeared. The quantity which had been given varied from 20 to 40 cubic centimetres, and in some cases as much as 60, 90, and 140 cubic centimetres were given. The interval between the separation of the membrane and its reappearance varied from one to five days; in one case it was seven days. As a rule an injection of 10 cubic centimetres caused the membrane again to separate in from 24 to 48 hours. In one case the resistance was very great A child, aged 10 years, for various causes received injections on the first, second, third, fourth, fifth, seventh, and ninth days of the disease, amounting in

all to 130 cubic centimetres. Membrane re-formed on the eleventh day, but disappeared under an injection of 10 cubic centimetres. Another indication for increasing the quantity of antitoxin is diphtheritic bronchitis; the dose should be double or treble the ordinary one. Hence the importance of early diagnosis of this complication by careful examination of the chest and of matters expectorated or discharged by the tracheotomy tube. Finally, the persistence of toxic symptoms is an indication to give more antitoxin. Thus a child showed toxic symptoms—prostration and acceleration and feebleness of pulse. The injection was repeated four times and on each occasion there was marked improvement, the prostration diminished, and the pulse became slower and stronger.

THE FOURTEENTH INTERNATIONAL CONGRESS OF MEDICINE, MADRID, 1903.

THE Fourteenth International Congress of Medicine will be held at Madrid from April 23rd to the 30th, 1903, under the patronage of King Alphonso XIII. and the Queen Regent. The subscription is 30 pesetas (equivalent to 24*s.*). Ladies accompanying members will be entitled to the privileges of the members in the reduction of fares on the Spanish railways, &c., on payment of 12 pesetas apiece (or 10*s.*). The National Committee for Great Britain and Ireland remains the same as at the Paris Congress, Sir William Mac Cormac, Bart., K.C.B., K.C.V.O., being the President. The honorary secretaries are Dr. Percival Horton-Smith of 15, Upper Brook-street, Grosvenor-square, London, W., and Mr. D'Arcy Power, of 10A, Chandos-street, Cavendish-square, London, W.

EPHEMERAL MENTAL DISORDER AND ITS MEDICO-LEGAL ASPECTS.

DR. CHARLES ALDRICH, neurologist to the Cleveland City Hospital, in the May number of the *Philadelphia Medical Journal* deals with the important subject of ephemeral mental disorder (mania transitoria) and refers to its medico-legal aspects. The occurrence of such a condition having a duration of a few hours or a few days—15 to 48 hours according to Kellog—is usually followed by many hours of deep sleep, and owing to its brief duration only symptomatic treatment is possible. The disease usually occurs in young persons and has close affinities with certain forms of psychical epilepsy. Dr. Aldrich records the following two cases. Case 1.—A young woman aged 18 years, with a good family history and free from epileptic attacks or mental aberration, was employed as a domestic servant. She was of steady and religious habits and never addicted to alcohol or narcotics. One morning about 4 o'clock her mistress was aroused by someone beating at her door and loudly calling to her to come out. She opened the door and saw the servant standing in her night-clothes with a Bible under her arm urging her mistress to come with her. She was saying that "the world was about to end and Christ had sent her to save her mistress." The mistress realised that the girl was in a delirium, soothed her, and told her to dress. The girl retired and reappeared dressed, ate a hearty breakfast, meanwhile talking incoherently on religion and the threatened destruction of the world. She then went with a friend to see a procession, keeping her Bible under her arm and maintaining perfect silence for over an hour. Then she said that she felt tired, and on returning home immediately undressed herself and went to bed, sleeping soundly for five hours, after which she awoke "with a dim recollection of the street pageant." She was free from somnambulistic traits and has since the above occurrence never manifested any other symptom of mental aberration. Case 2.—A man aged 40 years, married and in good health, was employed as a workman. He had been always free from mental aberration. "One day while at work ..... he went to his foreman and complained that two of his fellow-workmen were plotting to kill him, and that one of them had a knife concealed in his clothing." The man seemed so sincere and had always been such a sober, industrious, and peaceful workman that the foreman called the other two men to account, who being innocent were perfectly astounded. The patient, however, insisted vehemently on their guilt, and said he had heard their plotting and seen the knife. Of this there was no proof and he was taken home and thence to the Cleveland City Hospital and remained in bed a few days and was discharged. Before his discharge he realised he had been the victim of a delusion and seemed surprised and could assign no cause for it. He had not, says Dr. Aldrich, had a recurrence of any mental symptoms since then or any disturbance of the nature of insanity or of epilepsy. Kellog states that such cases of ephemeral mental disorder are of great judicial interest, "since responsibility cannot exist where consciousness is in abeyance." The treatment was devoted to relief of symptoms and included the administration of hyoscine and morphia as cerebral sedatives, and careful supervision to prevent criminal or suicidal acts during the period of impaired and abnormal consciousness.

UNIVERSITY OF LONDON.

A MEETING of the Faculty of Medicine was held at the University on Friday, July 20th, at 5 P.M. Although the business was specially important less than 30 members were present. An interim report from the Concentration Committee was first presented, but its consideration was postponed until a final report is laid before the members of the faculty early next winter session. Reports were also received from the Boards of Preliminary and Intermediate Medical Studies. The consideration of the reports was also deferred until October, as there was much division of opinion as to whether there should be separate examinations at the Preliminary M.B. Examination in botany and zoology, or whether these subjects should be taken collectively under the general term of biology. The Senate has decided to publish a gazette as a record of matters connected with the University.

THE DIETETIC TREATMENT OF EPILEPSY.

THE dietetic treatment of epilepsy, one of the most hopeful and effective of the more recent therapeutic methods introduced, is dealt with in a recent issue of the *Berliner Klinische Wochenschrift* (June 10th, 1901), by Dr. Rudolf Bálint who contributes an important article based upon observations made by himself at the Clinic of Professor Koranyi in Budapest. The work was undertaken in consequence of the theory advocated by Richet and Toulouse that "salt-starvation" and the administration of alkaline bromides constituted the most effective form of treatment. Dr. Bálint treated 28 epileptic patients who were the subjects of idiopathic epilepsy (*petit mal* and *haut mal*) with a diet from which all chlorides were as far as possible removed, after which a small amount of bromides was added. A number of preliminary trials were made and eventually the following daily diet table was adopted as one satisfying the necessary conditions—viz., from one to one and a half litres of milk, from 40 to 50 grammes of butter, three eggs, and from 300 to 400 grammes of bread and fruit. The bread was specially prepared without common salt and with the addition of three grammes of sodium bromide per loaf. Living on the above diet a patient would consume altogether only about two grammes of sodium chloride per diem, a quantity very much below the average consumption of the salt in every-day diet, while at the same time he would be unconsciously taking about three grammes of sodium bromide daily in his food. The results obtained

were highly satisfactory in all the 28 cases. There were a reduction of the epileptic attacks in both frequency and intensity, an improvement as regards mental clearness, and a disappearance of the mental confusion and stupidity so often characteristic of epileptic patients. The general bodily health rapidly rose and "bromism" was never produced. The salient feature was that the sedative action of the bromide was enhanced. Dr. Bálint points out that the treatment is not difficult to carry out and is especially useful and practicable in large institutions where a regulated diet can be enforced. It was a method of treatment attended with no danger and it was especially likely to be useful in epileptic farm colonies and institutions of a like nature.

THE first general meeting of the International Dental Federation will be held in Cambridge on Wednesday, August 7th, the day after the conclusion of the meeting of the British Dental Association in London. Trains for Cambridge leave King's Cross at 9 A.M., Liverpool Street at 9.10 A.M., and St. Pancras at 9.15 A.M. Conferences and committee meetings will occupy the day from 11 A.M. to 5 P.M., when there will be a garden party at Merton Hall, followed by a banquet in Downing College. All members of the British Dental Association and other British dental societies are entitled to attend.

IN consequence of the great pressure on our space, owing to the extensive reports of the British Congress on Tuberculosis and of the annual meeting of the British Medical Association at Cheltenham, we are compelled to hold over the publication of many articles and communications of interest and importance, including our comments on the Interim Report of the Royal Commission on Sewage Disposal.

IMPORTANT VIEWS ON THE RELATIONS BETWEEN HUMAN AND BOVINE TUBERCULOSIS.

AT the present juncture the views of the following three eminent men will be read with interest.

Lord Lister's View.

The following is the full text of Lord Lister's speech made at the second general meeting of the British Congress on Tuberculosis:—

He said that the discourse they had listened to was full of profound interest from the beginning to the end. But what had chiefly riveted their attention had been the startling thesis that bovine tubercle could not develop in the human body. This was a matter of enormous practical importance because if this conclusion were sound it would greatly simplify their preventive measures, but it would be a very serious and grievous thing if the rules now in force for securing purity of milk-supply should be relaxed and it should turn out after all that the conclusion was erroneous. For his own part he thought the evidence adduced by Dr. Koch to show that human tubercle could not be communicated to bovine animals very conclusive. At the same time he agreed with him that in a matter of such great importance further inquiry was desirable. But even if that were established it would by no means necessarily follow that bovine tubercle could not be communicated to man. He took in illustration the case of variola. Attempts to inoculate human small-pox into the calf had been so very rarely successful that eminent pathologists had concluded that small-pox and cow-pox were two entirely different diseases. We now knew that this was an entire mistake; that cow-pox was small-pox modified by passing through the cow. He referred to some very instructive experiments by Dr. Monckton Copeman, who entirely failed to inoculate human small-pox into the calf but invariably succeeded in inoculating it into the monkey, and was as invariably successful when he introduced matter from the pustules in the monkey into the calf, the result being ordinary cow-pox which could be used for vaccinating children. It might be that some species of animal might serve as an intermediary host for tubercle between man and the bovine species. Or it might turn out that, if a sufficient number of experiments were made, human tubercle might prove occasionally transmissible to the bovine animal, as small-pox was in rare instances to the calf, and that the bovine tubercle so produced might be transmissible to man, as was the virus of vaccine. The evidence, necessarily indirect, on which Koch relied as showing that bovine tubercle could not be transmitted to man, did not seem at all conclusive. It consisted mainly in the alleged rarity of primary tuberculous intestinal lesions in children in spite of the multitudes of tubercle bacilli swallowed by them in milk. Even if it were admitted that primary tuberculous intestinal lesions were as rare in children as Koch's statistics indicated it was certainly true that tabes mesenterica existed in a considerable percentage of children who died from tuberculous disease without tubercle being found in any other part of the body. When the mesenteric glands were thus affected without any discoverable intestinal lesion, the natural, and, indeed, inevitable, interpretation seemed to him to be that the tubercle bacilli had passed through the intestinal mucous membrane without causing obvious lesion in it, and had been arrested in the glands of the mesentery. It was known that even typhoid bacilli, the essential place of development of which was the intestinal mucous membrane, occasionally passed through it without producing the characteristic lesion. And if this might occur with the typhoid bacilli, how much more likely was such an occurrence with tubercle bacilli? If this were so, Koch's main argument fell to the ground. As regarded the experiments which Koch had referred to of inoculating bovine animals with material from the glands of children affected with tabes mesenterica, the result being negative, these experiments had been but few; and even were they more numerous, they would not, to his mind, be quite conclusive. It might be that tubercle from milk in the intestines might be so modified by passing through the human subject that the bacilli in the mesenteric glands, though derived from a bovine animal, might be no longer those of true bovine tubercle but bacilli having the characters of human tubercle little disposed to develop in cattle. The Congress would probably require a more searching inquiry into the subject before accepting this doctrine of the immunity of man to bovine tubercle.

In the evening issue of the *Berliner Lokal Anzeiger* of Friday, July 26th, there appeared a report of interviews which a representative of that journal had had with Professor Virchow and Professor Heubner on the receipt in Berlin of the particulars of Professor Koch's pronouncement as to the difference between bovine and human tuberculosis. The following is a free translation of their remarks.

Professor Heubner's View.

Professor Heubner, who was first to be interviewed, said:—

If Koch in his address in London expressed the opinion that hereditary transmission is a very rare occurrence I am fully in agreement with him. In the course of my very long experience of clinical investigation I have had innumerable children under my care whom I have closely observed, but I have not detected a single case of hereditary transmission. I must emphasise the fact that I speak now only from my own experience, for I am well aware that other medical authorities believe that such transmission does occur, and I am by no means prepared to say that it does not or never has done. Still, I take up on this matter a position side by side with Professor Koch. And this I do with regard to the second question. I, also, believe that the transmission of bovine tuberculosis to man is exceedingly unlikely. On the other hand, several arguments can be brought against Professor Koch's conclusions, and one of them has already been well expressed in London by Lord Lister, who says: "Human tuberculosis is regarded by Koch as not transmissible to cows even if they are inoculated with tubercle bacilli, but this does not prove that bovine tuberculosis is not transmissible to man." The final word on the two questions under consideration has not as yet been spoken, but, as I have already said, I am in complete accord with Professor Koch in his opinion concerning them.

Professor Virchow's View.

Professor Virchow expressed himself as follows:—

I have for many years opposed the theoretical belief in hereditary transmission of tuberculosis in man, but, on the whole, I do not agree with Koch. In a discourse which I gave at a recent meeting of the Berliner Medicinische Gesellschaft I left no doubt concerning my standpoint on this matter, for I dealt minutely with the conclusions which Professor Koch enunciated before the Congress on Tuberculosis. I would point out that Koch, in summarising the results of his investigations, disregarded the conclusions for which we are indebted to the Copenhagen school. In order to ascertain what was best that could be done for the health of the people, and particularly what foods and liquids they should avoid, the Danish Government appointed a Commission which, it appears, consisted mainly of medical officers and was known as the Council of Health. Among the many questions which the council paid careful attention to was, of course, that of bovine tuberculosis, and for the purpose of settling the question in a scientific manner the most minute investigations were made and the results of these investigations form practically the basis upon which all subsequent public health acts are founded. I may refer to our enactments concerning quarantine, for instance, in illustration of the extent of our indebtedness to the scientific work of the Copenhagen school. The conclusions arrived at by the Danish scientists are very different in character from those of Professor Koch. The question is anything but settled.

EDINBURGH UNIVERSITY.—At the summer graduation ceremonial of Edinburgh University, which took place on July 27th in the M'Ewan Hall, the degree of Doctor of Medicine was conferred on 61 candidates, six of whom were awarded gold medals for their theses. The gold medallists were: James Martin Beattie, Thomas Hastie Bryce, Evan John Hewat Fraser, Alfred Charles Sandstein, Sutherland Simpson, and Donald Bremner Waters. The Ettles Scholarship was awarded to Caleb Williams Saleeby. The degrees of M.B., C.M. was conferred on 11 candidates and the degree of M.B., Ch.B. on 147. The address to the graduates was delivered by Professor John Wyllie.

THE BRITISH CONGRESS ON TUBERCULOSIS.

HIS MAJESTY THE KING received at Marlborough House on Thursday afternoon, July 25th, the foreign delegates to the Congress. His Majesty shook hands with each delegate in turn and then made the following speech:—

"GENTLEMEN,—Let me express to you the great pleasure and satisfaction it has given me to ask you to come here to-day, and I only regret that you should have arrived during such a severe thunderstorm.

It has been a source of great concern to me that owing to circumstances over which I had no control I was prevented from presiding at the opening of your important Congress and attending its meetings, but I can assure you that though not present I take the deepest interest in its proceedings and that I follow, through the medium of the daily press, with much interest the papers which are read and the discussions on the subject.

There is no more terrible disease than that known as consumption, and I only hope and trust that you may be the means of minimising its evil effects and thereby receive the gratitude of the whole world.

There is still one other terrible disease which has up to now baffled the scientific and medical men of the world, and that is cancer.

God grant that before long you may be able to find a cure for it or check its course. I think that to him who makes the discovery a statue should be erected in all the capitals of the world.

In taking leave of you I trust that your stay in London, and in England, has been an enjoyable one, and that you will one and all carry away pleasant recollections of your visit to my country."

THE FOURTH GENERAL MEETING.

The fourth general meeting of the Congress was held in the Queen's Hall on July 25th, at 3 P.M., to hear an address from Professor J. MCFADYEAN, M.B., M.R.C.V.S., on Tubercle Bacilli in Cow's Milk as a possible Source of Tuberculous Disease in Man. This will be found in full on p. 268. Much interest was taken in the delivery of this paper, as it was an open secret that it would be a direct answer to the views of Professor Koch.

The chair was taken at the meeting by Lord SPENCER who, before he called upon Professor McFadyean to deliver the address, pointed out that though he himself was a layman and did not imagine he could give an opinion regarding the scientific view of the matter, still for the pronouncements of scientific men to be of use they must have the support of public opinion. In his judgment he still considered that the public should be protected from the sale of milk from diseased sources. The agriculturists had a great deal of risk in this matter and though he had great sympathy with the views expressed by Mr. Chaplin he felt confident that the agricultural world would give its support to the regulations required to prevent infection from tuberculosis.

Sir JAMES CRICHTON BROWNE informed the meeting that the official delegate of the State of Wisconsin (Dr. Brown) had received an answer from his Government to a telegram which he had despatched giving Professor Koch's statements and the answer was that they would "begin experiments to-morrow." He considered that further consideration was necessary before accepting Professor Koch's views and that the Government should undertake an investigation.

The next two speakers were Professor NOCARD and Professor D. J. HAMILTON (Aberdeen), who declared that bovine tuberculosis was a source of danger to the human race.

Dr. M. P. RAVENEL (Philadelphia) instanced several cases where bovine tuberculosis had occurred in man from accidental infection.

Professor E. M. CROOKSHANK said that in consequence of the publication of Professor Koch's opinion the measures that had been devised for the safety of the public might be paralysed. At that Congress a great variety of interests were represented and they would all agree that free and open discussion was the only way to secure the truth. His own opinion was that Professor Koch was quite wrong in consequence of a too precipitate generalisation from the facts before him. He protested against Professor Koch's view that no measures should be undertaken for the prevention of infection of man from bovine tuberculosis.

The proceedings closed with a vote of thanks to Professor McFadyean.

THE FINAL GENERAL MEETING.

Under the presidency of Lord DERBY the fifth (and final) general meeting of the Congress was held at Queen's Hall on July 26th.

Lord DERBY said they had reached the last stage of their official proceedings at the Congress and it became their duty to submit certain resolutions which had been arrived at in the sections. He thought the Congress had achieved a success which would render it one to be remembered among the history of similar congresses in the world.

Mr. MALCOLM MORRIS proposed:—

That tuberculous sputum is the main agent for the conveyance of the virus of tuberculosis from man to man and that indiscriminate spitting should therefore be suppressed.

He said it was not a particularly pleasant subject, but it was the key to the whole question, and they must come boldly to the point and carry the motion.

Mr. HAROLD SWITHINBANK seconded the resolution and said that it was time that they prevented the indiscriminate distribution of tuberculous poison in sputum in the streets.

The motion was put and carried.

Professor G. SIMS WOODHEAD proposed:—

That it is the opinion of this Congress that all public hospitals and dispensaries should present every out-patient suffering from phthisis with a leaflet containing instructions with regard to the prevention of consumption and should supply and insist on the proper use of a pocket spittoon.

Sir WILLIAM BROADBENT, in seconding, said that a measure of that kind was of the first necessity to prevent the out-patients' departments becoming centres of infection.

The motion was carried.

Dr. J. NIVEN (Manchester) proposed:—

That the voluntary notification of cases of phthisis attended with tuberculous expectoration and the increased preventive action which it has rendered practicable has been attended by a promising measure of success and that the extension of notification should be encouraged in all districts in which efficient sanitary administration renders it possible to adopt the consequential measures.

He said that in dealing with such a large subject as the notification of phthisis he could not do wrong in saying that the way in that practical measure had been shown to them by their American cousins in New York where they had carried on in ever-increasing efficiency a large measure of notification of phthisis.

Professor T. CLIFFORD ALLBUTT (Cambridge), in seconding the motion, which was duly carried, said that it was possible by the means proposed to enable working men to attend to their work while under treatment.

Sir JOHN BURDON SANDERSON (Oxford) proposed:—

That the provision of sanatoria is an indispensable part of the measures necessary for the diminution of tuberculosis.

He urged that sanatoria were of great value to all classes of the community, but especially for the poor workman whose earnings were only sufficient to cover his expenses, but who was too poor to make proper provision against the great calamity of sickness.

Sir RICHARD DOUGLAS POWELL, in seconding the motion, which was carried, said it was quite unnecessary for him to add any words to the eloquent remarks of the proposer.

Sir HERBERT MAXWELL proposed:—

That in the opinion of this Congress and in the light of the work that has been presented at its sittings medical officers of health should continue to use all the powers at their disposal and relax no effort to prevent the spread of tuberculosis by milk and meat.

He said that those who had heard the magnificent oration of Professor Koch on the one hand, and of Professor McFadyean on the other hand, would perceive that, like other questions, it had two sides.

Lord SPENCER seconded the motion, which was carried, and said that he would like to urge on all those who have to act in that matter the advisability of judicious methods of administration with a certain amount of elasticity and a great deal of good sense in their regulations.

Dr. G. A. HERON moved, and Mr. F. J. LLOYD seconded, the following:—

That in view of the doubts thrown on the identity of human and bovine tuberculosis it is expedient that the Government be approached and requested to institute an immediate inquiry into this question, which is of vital importance to the public health and of great consequence to the agricultural industry.

Dr. R. FARQUHARSON, M.P., said that though they could not ignore such an authority as Professor Koch he thought they had done well to keep to the *status quo ante*.

The motion was then put to the meeting and carried unanimously.

Sir JAMES CRICHTON BROWNE moved that—

The educational work of the great national societies for the prevention of tuberculosis is deserving of every encouragement and support. It is through their agency that a rational public opinion may be formed, the duties of public health officers made easier of performance and such local and State legislation as may be requisite called into existence.

He said that the work of the Congress could be summed up in the one word "enlightenment."

Dr. ALFRED HILLIER seconded the motion which was put and carried.

Sir WILLIAM BROADBENT moved the following:—

That this Congress is of opinion that a permanent national committee should be appointed (*a*) to collect evidence and report on the measures that have been adopted for the prevention of tuberculosis in different countries; (*b*) to publish a popular statement of these measures; (*c*) to keep and publish periodically a record of scientific research in relation to tuberculosis; and (*d*) to consider and recommend measures of prevention. This Congress is further of opinion that such a committee should consist of representatives to be elected by the great national societies formed for the suppression of tuberculosis and also representatives nominated by various Governments. It is further of opinion that all international committees and great national societies whose object is the prevention of tuberculosis should be invited to coöperate.

He said that the Congress was doing magnificent work in exciting public interest and spreading information.

Professor BROUARDEL, in seconding the motion, said that the work which they had done would help in the struggle against tuberculosis.

The motion was carried.

Professor CROOKSHANK proposed:—

That, in the opinion of this Congress, overcrowding, defective ventilation, damp, and general unsanitary conditions in the houses of the working-classes diminish the chance of curing consumption and aid in predisposing to and spreading the disease.

He said that they must not confine their attention to the tubercle bacillus alone but must consider the other factors in the production of tuberculosis.

Dr. C. THEODORE WILLIAMS seconded the motion and explained how the depressing conditions under which they lived caused the milliner, the tailor, the printer, and others to become liable to the attacks of the disease.

The motion was carried.

Professor BROUARDEL submitted the following motion which was seconded by Professor CALMETTE and duly carried:—

That while recognising the great importance of sanatoria in combating tuberculosis in every country the attention of Governments should be directed towards informing charitable and philanthropic individuals and societies of the necessity for anti-tuberculous dispensaries as the best means of checking tuberculous disease amongst the industrial and indigent classes.

The last motion was proposed by Professor ROBIN and seconded by Sir WILLIAM BROADBENT and carried:—

That the following question be submitted to the consideration of the next Congress:—The constitutional conditions of the individual which predispose to tuberculosis and the means whereby they can be modified.

The CHAIRMAN, after replying to a question from Mr. BOWEN-JONES (Shrewsbury), who spoke from the back of the hall and to whom he explained that the resolutions of the Veterinary Section were not submitted because they were unsuitable for discussion at that particular meeting, congratulated the members of the Congress on the successful termination of their labours.

THE SECTIONS.

SECTION I.

STATE AND MUNICIPAL.

THURSDAY, JULY 25TH.

DIVISION IV., THE INTERNATIONAL ASPECTS OF TUBERCULOSIS.

A general discussion upon this subject was opened by Dr. ALFRED HILLIER (London). Having dealt with the conditions essential to the establishment of tuberculosis in man Dr. Hillier proceeded to discuss the measures which had been taken by science to check the introduction of the bacillus. Could they doubt that protection from the indiscriminate distribution of sputum would result in tuberculosis becoming more completely under control than small-pox? He then considered what was being done in the civilised States of Europe and America to check the disease and then in general terms mentioned what they were called upon most urgently to do. The movement for the provision of sanatoria in Germany was ahead of that in all other countries, and this was for all classes. The United States had certainly led the way in practical downright measures of prevention. To France must be accorded the honour of having done more for the education of public opinion than probably any other country. It was worth noting that Norway had recently passed a law making notification of tuberculosis throughout the kingdom compulsory. Denmark also had taken its full share in the struggle against the disease. He suggested the formation of a committee in which all civilised countries should be represented and its work should be to formulate the principles on which all were agreed and to define the broad line of action which should be taken. Legislation could never terminate by itself many of the abuses associated with the spread of tuberculosis, but if fortified by public opinion it could and would do so.

Dr. F. MONTIZAMBERT (Canada), Director-General of Public Health, Ottawa, Canada, Delegate of the Canadian Government, read some

Notes on Tuberculosis in the Dominion of Canada.

He said: Tuberculosis in the Dominion of Canada, as elsewhere, has heretofore levied a heavy tax upon the well-being and the lives of the people. Some 8000 deaths per annum in Canada are attributed to this disease. Some of these are, of course, amongst native-born Canadians; others are amongst those who have brought the seeds of the disease with them from other countries. Here, as elsewhere, the knowledge of the true nature of the disease and of the methods of its spread has advanced *pari passu* with the advances of medical science. With this extension of knowledge in the medical profession have come also wiser counsels to patients and their friends and to the public. This was until recently only the action of boards of health, of medical societies, of individuals, and of comparatively small local associations. This year, however, Lord Minto, the Governor-General of Canada, has organised a national movement for the prevention and cure of this disease—the Canadian Association for the Prevention of Tuberculosis. Of this association his Excellency is the honorary president. The first meetings were held in Ottawa in February last and the work of this general national movement was begun—the work of endeavouring to rouse to a sense of their danger the mass of the people, whilst at the same time a knowledge of the possibility of prevention and cure is brought home to their minds and they are thus both encouraged and urged to take the practical measures necessary to attain the great object in view—the limitation, if not, indeed, the extinction, of this preventable disease. Already some of the municipalities are moving in the matter. If there be anything in climatic influences in the prevention and cure of tuberculosis Canada offers a wide field for choice. She stretches from ocean to ocean and her vast inland tablelands and mountain ranges offer all the elements of dryness, altitude, and clearness of atmosphere, with absence of strong penetrating winds, that may be desired. And this with a variety of grandeur of scenery and full opportunities for outdoor sports, hunting, fishing, &c., for those who seek them; and for all the pleasant summer weather and the dry and invigorating cold in winter render life and rest out of doors a possibility and a benefit at all seasons of the year by night as well as by day.

Professor ROBINSON (America) referred to the measures which had been taken in the State of Maine to combat disease and which were attended with some success. The first essential was a systematic education of the people in reference to the evils caused by phthisis. This great work of education had begun 11 years ago and the result was really remarkable. In seven years there had been a lessening of the mortality rate due to phthisis of more than one-fourth. Sanatoria were being built by voluntary contributions.

Dr. VAN RYN (Belgium), General Secretary of the Belgium National League against Tuberculosis, having passed in review the Present Position of the Crusade against Human Tuberculosis in various countries,

Dr. HOLZER RÖRDAM (Denmark), Chief Physician of the First Class of the Denmark Naval Marine, described the

Measures taken against Tuberculosis in Denmark.

Compared, he said, with many other countries in Europe,

Denmark remained for a long while behindhand in the struggle against tuberculosis, but during the last few years the inhabitants had taken up the matter with considerable energy. The oldest hospital for tuberculous patients was situated in the peninsula Refsnaes. It was founded in 1874. It was arranged at first for 100 patients; later, it was increased to accommodate 130, without reckoning 12 beds in the establishment for patients suffering from epidemic complaints and 16 beds in the ward for ordinary diseases. The hospital only admitted scrofulous children. The construction of the whole establishment had cost about 500,000 francs, and the fitting of it up about 60,000 francs. The money for the construction and the working of the hospital had been furnished up to a certain point by private benefaction, but the State and the municipalities had also contributed their quota. The municipality of Copenhagen possessed, in addition, a small hospital for scrofulous patients at Snogebeck, in the island of Bornholm, where 70 children were treated last year, this costing 10,000 francs. The Society for Children's Hospitals in Copenhagen and its Suburbs, which was formed 10 years ago, now possessed an establishment at Hellebock, at which 197 children were treated in 1899. The aim of the society was to found a sufficient number of small hospitals situated on the sea-coast, where weakly, and above all scrofulous, children should be admitted without pay. The Finsen Institute was founded at the initiative of Professor Niels Rigberg Finsen, in 1896, for the purpose of making experiments, and of contributing to the progress of research on the effect of light on living organisms; above all, with the intention of utilising the rays to the benefit of practical medicine. The institute, the administration of which was under the presidency of M. Blagemann, manufacturer and municipal councillor, had received numerous private donations, and by the Financial Act of 1900 it had been voted a sum of 350,000 francs as a loan without interest. The institute was established at Rosenvaenget in Copenhagen. The number of lupus patients who had been cured was very considerable. A large hospital for scrofulous children at Juilsmind was in course of construction; the treasury had supplied 80,000 francs, and Prince Carolath had made a present of an excellent site. As a hospital for phthisis properly so called there existed but one at the present time, situated on the fjord of Vejle à Fakkegrav; it was opened on March 1st, 1900, with room for 92 patients. The hospital was founded under the name of "Hospital for Consumptives" by a society the aim of which was philanthropic. The dividend on shares being limited to 4 per cent. the subsequent profit would be employed to lessen the payments of those in straitened circumstances. Danish physicians had contributed a sum of 60,000 francs, and private persons 300,000 francs. The treasury had given 150,000 francs, and for non-paying rooms a donation of 30,000 francs had been received. The sanatorium was situated on the fjord of Vejle and possessed considerable forest land. All expenses included, the hospital had cost about 1,100,000 francs—that was to say, 12,000 francs per bed. During the 10 months March to December, 1900, 206 patients had been treated at the sanatorium. The payment for Danish subjects per day was from 10 to 11 francs for a separate room and from eight to 10 francs for a common room. To foreigners the highest fee was five francs daily. The hospital was under the management of Dr. Sangmann, the head of the staff. The municipality of Copenhagen were having a sanatorium for consumptives constructed in the forest of Boscrup, near Roskilde. Up to the present day this was all that had been done in Denmark in the way of constructing sanatoria. In 1898 the Association of Danish Physicians presented a petition, supported by an address signed by 200,000 of the population, to the Government and to the National Assembly having as an object the construction of sanatoria for consumptives as well as the founding of hospital establishments and the supply of aid to the families of patients. For this purpose they demanded the nomination of a commission, and the relief organisations in cases of sickness had in 1900 presented an address, supported by 250,000 signatures, requesting the establishment of three State sanatoria. On grounds of expense the Government had not ventured to include this item in their Budget. On Jan. 19th, 1901, at the instigation of the speaker and of M. Karl Loventsen, doctor of medicine and editor of the Danish journal of hygiene, the National League to Combat Tuberculosis was founded and was received with great enthusiasm on the part of political personages of the highest distinction, physicians, civil servants, and financiers. The minimum annual subscription was three francs, and the league now numbered 10,000 members, this giving an annual income of 100,000 francs. The aims of the league were the establishment of popular sanatoria for the poor, public lectures to enlighten people as to the nature of tuberculosis, and the giving relief to the families of patients. As to precautions established by law against tuberculosis, there were very few of them in Denmark. Gratuitous disinfection after cases of death due to tuberculosis was enjoined and apprentices before being admitted to manufactories were bound to show a medical certificate declaring that they were in good health, while by a new law relating to labour in factories decreed last year some regulations as to cleanliness in these establishments had been enacted. But that was all that had been done on the part of the Legislature. The Sanitary Commission of Copenhagen had enacted that practising physicians might have sputum examined for tubercle bacilli free of charge in doubtful cases of phthisis. Receptacles required for the receipt and transmission of the sputum were to be had from all the pharmaceutical chemists in the city, and were delivered up for examination at the laboratory of the Sanitary Commission, 12, Norrevaldgade. The laboratories, in their turn, would send a written report on the result of the analysis to the physician concerned at the earliest possible moment. In almost all the towns of Denmark control over meat-supply was established, but it was solely an affair of the town whether it elected to put such control in force. In regard to tuberculosis among animals, thanks to the efforts of Professor B. Bang, Denmark occupied a position among the most advanced nations. In almost all the principal towns there were private associations which were charged with controlling the wholesomeness and the price of milk. All things considered, it appeared that Denmark had not progressed badly in the battle with tuberculosis. The mortality caused by tuberculosis was diminishing in a marked manner.

M. DA SILVA ARNADO, as a representative of Portugal, spoke of the anti-tuberculous movement in that country.

Control of Milk Supplies.

Professor S. DELÉPINE (Manchester) was set down in the programme to open a discussion upon the Exact Statistics of the Tuberculin Test. Those who know the enormous amount of accurate and expensive work that has been done in Manchester by Professor Delépine and his colleagues will regret that this communication should have been crowded out.

Professor DELÉPINE proposed, and Dr. J. ROBERTSON (Sheffield) seconded, a motion against accepting Professor Koch's conclusions and proposing that further inquiry should be made into the subject and that the matter should be brought before the Local Government Board and the Board of Agriculture. This motion, which was carried unanimously, was introduced by Professor Delépine in the following manner:—

I feel it necessary to allude to the statements of Professor Koch two days ago regarding the relations of human and bovine tuberculosis. On reading the newspapers yesterday I was much pained to find that Professor Koch had made a statement which would undoubtedly deal a great blow to the work of those who were responsible for the public health of this country. Such a blow seemed to me unnecessary and unjustifiable under the circumstances. It is hard to disagree with the discoverer of the tubercle bacillus and of tuberculin, and the task is as ungrateful as it is hard. I feel, however, that Professor Koch, before making statements challenging the accuracy of facts which, to all competent observers, are well-proved facts, should have given us the means of finding how it was that we had been deceived by scientific observation which appeared to be reliable. He should have opened our eyes and shown us that what seemed facts, and which I still believe to be facts, were not facts at all, but erroneous interpretations. I think that Professor Koch's great authority and high position do not justify his disturbing public opinion by expressing views unsupported by evidence; on the contrary, his position should make him more careful than any other man, for his statements are bound to have a considerable influence upon those who have no means of testing his views by their own experience. I have said that I still believe in the evidence proving the unity of human and bovine tuberculosis. The evidence is, I believe, very clear. 1. We have cases of

veterinary surgeons becoming infected with tuberculosis as a result of wounds received during the necropsy of tuberculous cattle. Several such cases are fully recorded as authentic and their existence cannot be denied. We have much post-mortem evidence to support the idea that bovine tuberculosis can produce tuberculosis in children by ingestion. 2. We have evidence that human tuberculosis can be communicated to most of our domesticated animals. 3. In certain animals used as test animals—e.g., the guinea-pig—inoculation with products from human and bovine tuberculous subjects produces a disease which has all the chief characteristics of tuberculosis in either man or cattle. This tuberculosis can be almost invariably obtained and follows a very definite course, as I have been able to satisfy myself by some 3000 personal experiments. 4. Tuberculin which contains specific chemical products generated by the tubercle bacilli can be obtained from tubercle bacilli of various origins, and tuberculous cattle react to tuberculin prepared with these various bacilli. Before all these facts can be explained I think that it will be impossible for us to admit the view that human and bovine tuberculosis are essentially different, as was formerly believed before the experiments of Villemin. I think, therefore, that the authorities will do well not to relax their efforts and should continue to combat bovine tuberculosis as strenuously as ever. I will therefore move the proposition, which has the support of your President, Sir Herbert Maxwell, and of Dr. J. Niven, Dr. A. Newsholme, and Dr. H. T. Bulstrode.

A proposition was then read against accepting Professor Koch's conclusions and passed unanimously. Slightly shortened, it was passed unanimously at the fourth general meeting on Friday, July 26th.

Next came Mr. J. S. LLOYD, whose paper on the Veterinary Work in Connexion with the Milk Clauses in Manchester will be found on p. 274.

Dr. P. BOOBBYER (Nottingham) proposed, and Mr. JAMES DICK (Glasgow) seconded, a motion urging that the Local Government Board should issue a circular or memorandum with regard to this question, which was carried unanimously.

Dr. MALM, a delegate of the Norwegian Government, then submitted the following aphorisms with regard to the use and value of tuberculin:—1. The tuberculin employed as diagnostic should be a tuberculin produced on the same principles as that of Professor Koch in 1890. Its strength should be uniform and it should be of such toxic strength as to kill with certainty guinea-pigs infected from six to eight weeks previously within eight hours in doses of from 20 to 30 centigrammes subcutaneously. 2. Such a tuberculin produces unfailingly in tuberculous animals a febrile reaction of a distinct type. It is recommended that large doses should be given, even to young animals; there is no danger or inconvenience in always employing doses of from half a gramme to one gramme. 3. Tuberculin may at times also produce fever in non-tuberculous animals, but this fever is not typical and does not attain such a degree as in tuberculous cases. 4. If typical tuberculous reaction appears in an apparently healthy animal, and on dissection nothing tuberculous is found, it is the fault of the dissector. 5. To determine with certainty whether reaction exists or not it is necessary to take the temperature from the sixth to the twentieth hour, after injecting hourly or at least every second hour. 6. The fact that tuberculin in a few isolated instances produces fever in non-tuberculous animals is of no importance when the question is its usefulness as a means to eradicate tuberculosis, and in this respect it is decisive, as tuberculin invariably causes reaction in tuberculous animals. 7. The foregoing refers to animals treated for the *first* time. Most animals become more or less accustomed to the tuberculin, but this is uncertain and unreliable and can be overcome by the use of an increased dose or a tuberculin of greater toxic strength. 8. The practical combating of tuberculosis concerns administrative, economical, and social spheres and the answer must vary in different countries according to the prevalence of the disease and its extent, the system of farming and cattle-trade, and the pecuniary means available.

Mr. DROOP RICHMOND, F.I.C. (London), read a paper on

The Relative Advantages in the Prevention of Tuberculosis of the Use of Sterilised Milk, Pasteurised Milk, and Milk obtained from Herds free from Tuberculosis,

of which the following is an abstract:—*Efficiency of the three methods.*—All the methods, if properly applied, would yield milk free from tuberculous infection. *Chemical changes on heating milk.*—Changes take place in milk at the following temperatures. At about 60° C.—Formation of skin on the surface, if exposed to air. At about 70° C.—Conversion of the albumin into its less soluble form, and alteration of taste of the milk. At about 80° C.—Destruction of the substance in milk which reacts with the phenylenediamines and hydrogen peroxide (? enzyme, and substances conferring immunity from Barlow's disease). At higher temperatures, especially at 100° C. or above.—Caramelisation of the sugar, fusion of the fat globules, and marked alteration of taste; possibly slight change in the proteids or their combinations with salt manifested by the reactions towards rennet and litmus being modified. *Discussion of commercial methods.*—(*a*) Pasteurisation.—This term was applied to heating milk to any temperature between, say, 50° to nearly 100° C., for a short period (not exceeding 20 minutes). The work at the Wisconsin station had shown that it was important to keep the milk agitated. Pasteurisation in bottles or in the ingenious apparatus of Hewlett was not always to be depended on. The Lawrence pasteuriser did not provide for a sufficient length of heating to be absolutely safe. Pasteurisers consisting of jacketed pans with a revolving stirrer were the most efficacious and convenient. They could be so arranged that the milk ran through continuously and could be kept at the required temperature for any length of time. Pasteurised milk was scarcely distinguishable in taste from ordinary milk; the cream did not rise so rapidly if the milk had been heated over 70° C. (*b*) Sterilisation.—As the object of sterilisation was to kill all micro-organisms milk must be protected after sterilisation; this was secured by sterilising in vessels which were closed immediately after sterilisation was complete. Commercially intermittent sterilisation was not practicable, as the cost of handling the vessels several times was great and the cream had a tendency to fuse more and more at each successive heating. Two sterilisations were the utmost practicable; temperatures of 100° C. or over might be used and the length of heating depended on the temperature. Higher temperatures were more effective than lower ones. Sterilised milk was distinctly changed in taste and was deprived of anti-scorbutic properties; also, unless efficiently sterilised, highly resistant spores might be left undestroyed and as infantile diarrhœa was due to this class of organisms the milk might be dangerous. (*c*) Protection of milk by veterinary inspection.—The whole of the cows from which the Aylesbury Dairy Company's supply was derived were individually examined and periodically inspected by qualified veterinary surgeons with regard to the existence of any condition likely to render the milk harmful, and especially with regard to evidence of tuberculous disease. Every animal showing the slightest suspicion of tuberculosis was not only submitted to the tuberculin test and condemned if found to react, but its milk was also microscopically examined. The herds were placed under the personal supervision of local veterinary surgeons, who, in the same manner as the local medical officers had done for many years past, visited the farms frequently and regularly.

FRIDAY, JULY 26TH.

DIVISION V., THE PROVISION OF SANATORIA.

Sir JAMES CRICHTON BROWNE, F.R.S., gave an address on the Best Means of Promoting the Erection of Sanatoria for Phthisical Patients in which (1) the curable may have the best chance of recovery afforded to them; and (2) the incurable, whilst ceasing to be a source of danger to the community, may have their lives prolonged and receive the comfort necessary to their condition. He showed that the pathological and clinical evidence of the curability of consumption was convincing. The invaded lung was largely able to take care of itself, but stubborn though the resistance was to the ravages of the disease, yet the bodily powers required some reinforcement from without, and the medical world had come to the conclusion that this extraneous help was best afforded by the establishment of sanatoria. He did not claim finality, for the time might come when some sovereign remedy might be discovered to put an end to this disease. It was too early to form any numerical estimates of the good results of the sanatorium treatment. He concluded by dividing the patients into three classes: (1) the affluent, (2) the competent, and (3) the indigent, and laid down the lines of treatment for each class. The affluent class on the whole

were best treated at home with the proper care which their circumstances allowed them, but the two latter classes were best treated at sanatoria. He believed that sanatoria once built and started would be self-supporting, and the cost to the patient would be such as the means of his class would allow.

Mr. E. W. BRABROOK, C.B., Chief Registrar of Friendly Societies of Great Britain and delegate of the Royal Statistical Society to the Congress, spoke next. If the liability of friendly societies, he said, to claims for sickness and death would be diminished by the establishment of sanatoria it would be to the interest of such societies to contribute to a certain extent towards their construction and maintenance. This the societies had the legal power to do, under certain conditions, by Sections 22 and 37 of the Friendly Societies Act, 1896. The extent of their interest was not so great as might be supposed. The liability of their members to phthisis was not so great as was that of the general population. Again, early mortality relieved the society from its liability to future sick pay. Where children were admitted members they were required to pass a second medical examination at the age of 16 or 18 years. The ages of 3,699,804 members of friendly societies were recorded, 7 per cent. being under 16 years; 7 per cent. between 16 and 20 years; 67½ per cent. between 20 and 50 years; 14½ per cent. between 50 and 65 years; and 4 per cent. over 65 years. Trade unions might also, under certain conditions, join in the establishment or maintenance of a medical society. In four of the larger of these bodies the deaths from phthisis were from 10 to 13 per cent. of the total number of deaths, and the average age at death from phthisis varied from 35½ to 39½ years and from all causes from 43 to 52 years. The conclusion at which he arrived was that while theoretically the question put must be answered in the affirmative the financial interest of the societies was too small to allow of its being reduced into practice to any material extent.

Sir JOHN BURDON SANDERSON then made certain propositions in respect of Sanatoria for Working Men and Women. In Germany, he said, more than 50 sanatoria, affording accommodation for about 4000 working men, were in operation. The success of the experiment had been such as to afford ground for believing that by the timely admission of the consumptive workman into a sanatorium his life might be prolonged. In Germany the funds required for maintaining workmen's sanatoria were chiefly derived from the system of compulsory insurance against illness which existed in that country. It might be assumed that no such system could be established in England. It must, at the same time, be admitted that the expenditure required for the maintenance of the working man when incapacitated by sickness must be principally derived from his earnings; in other words, some form of voluntary insurance against disease must be regarded as the best substitute for the compulsory system as it existed in Germany. A system of sanatoria supported by voluntary insurance (as, for example, by the industrial insurance societies which existed in this country) could not be as efficient as a means of diminishing the frequency or spread of pulmonary tuberculosis as a system dependent on compulsory insurance. As regarded the individual contributor it would no doubt be more advantageous, because its benefits would not be extended to the inferior class of workmen who were most liable to phthisis. But for the same reasons it would be less advantageous to the health of the community, for in this relation the degree of advantage arising from the prompt removal of an infected person from his dwelling and its insanitary surroundings was proportional to his poverty. A system which would provide for the well-to-do workman, excluding the toiler whose earnings were not more than sufficient for bare maintenance, would be unsatisfactory unless it were largely supplemented by funds derived from other sources.

Herr BIELEFELDT (Berlin) gave a description of the battle against consumption as carried on in Germany with the aid of the German workmen's insurance. He expressed the conviction after several years' experience that an effective battle against consumption among the working classes would have been impossible without the workmen's insurance in Germany, with its powerful pecuniary resources and its legal and social regulations.

Mr. FREDERICK L. HOFFMAN, statistician to the Prudential Insurance Company of America made a communication to the section, by invitation, upon Industrial Insurance in Relation to the Prevention of Tuberculosis. By numerous interesting charts he showed that the deaths from tuberculosis in the United States of America amounted to about 200,000, but that the death-rate was gradually, if slowly, coming down. The Prudential Insurance Company of America, while recognising that the interests of industrial insurance companies in the prevention of tuberculosis were coincident in America with those of the population at large—for in the United States four-fifths of the population were insured somewhat on the industrial plan—did not consider that it would be expedient for them or any similar corporation to erect and to maintain sanatoria for the treatment of their policy-holders. If they were to entertain such a project they would at once be confronted with requests to make equal provision for other sufferers and even for the injured from accidents, and if they acceded to such requests the interests of their healthy policy-holders would be sacrificed to those of the sick.

Mr. Hoffman was followed by Dr. T. E. HAYWARD, medical officer of health of Haydock, who read a statistical paper on Mortality from Phthisis.

Lieutenant-Colonel MONTEFIORE, secretary to the Medical and Convalescent Committee of the Charity Organisation Society, read a paper on the Provision of Sanatoria, with Reference to Some of the Difficulties which Arise in Assisting the Phthisical Poor. He said that so much had been written on the development of sanatoria and by those abler than himself that he thought it well only to touch briefly upon the subject. Dr. Boddington's attempt in 1840 was the first institution of the kind in this or any other country, and it was more than 19 years after that time that the Brehmer Sanatorium in Görbersdorf was opened and to Dr. Brehmer must be given the honour of being the first to systematise the so-called "open-air" treatment of consumption. Dr. Dettweiler, in 1874, followed with the Falkenstein sanatorium. In 1888 the celebrated Nordrach Colony was opened under Dr. Walther. Now there were sanatoria in nearly every part of Germany, both for patients able to pay as well as for the poor. The recent development of the sanatoria in Germany was partly due to the action of the insurance companies who found it economical to erect these institutions for the treatment of the consumptives. In this country they had many recently built sanatoria for paying patients, but as regards the poor they were certainly far behind the Germans and the Americans. The French, too, had several institutions building, or complete, for their poor, and the Sanatorium d'Agincourt, built by l'Assistance Publique, with 50 beds, was opened last year. It was stated at the Berlin Congress on Tuberculosis in 1899 that phthisis had increased in every European country except Great Britain during the last 40 years, and that in Great Britain the mortality from this disease had declined by 50 per cent. within that time. Notwithstanding that decrease, it was stated by Dr. James Alexander Lindsay, in his address on the "Problem of the Consumptive Poor" at the opening of the session of the Ulster Medical Society in 1897, that there were in these islands 200,000 persons suffering from phthisis who might seek hospital relief, and there was only one bed for every 200 phthisical patients who might be expected to demand and require hospital relief, and in order to prove that he had not exaggerated he quoted from Sir Hermann Weber, that "well-arranged special hospitals for the treatment of consumption have accommodation only for one sufferer in a thousand." Dr. Walters, in his "Sanatoria for Consumptives," estimated the total number of beds for poor consumptives in hospitals and homes at 1270, which would be one bed to 1590 people, if they accepted the figures given by Dr. Lindsay, but they knew that their hospitals admitted other diseases than phthisis to their wards, which fact much reduced the available accommodation for the consumptive poor. When they looked for the special sanatoria to which to send their poor sufferers they found how few they were and how difficult it was to get admission for a patient to them. If there were an adequate number of sanatoria the special hospitals would be much relieved, their position would become readjusted, and they might become more in the nature of clearing houses, the patients being sent either to the wards for observation and treatment or direct to the country sanatoria. An exception must be made in the case of the North London Hospital for Consumption, Mount Vernon, Hampstead. They hoped the poor-law guardians of Metropolitan unions would carry out their intentions of erecting suitable sanatoria where such patients under their charge who were at all likely to benefit from the open-air treatment, might be sent, whilst separate wards in the infirmaries might be maintained

where in the less hopeful or the hopeless cases the patients might be kept apart from the other inmates. This had been done in several urban Poor-law districts. The National Association for the Prevention of Consumption and Other Forms of Tuberculosis, to which the whole nation should be most grateful, had awakened the public of this country and it was fervently to be prayed that this International Congress, which they had so wisely convened, might be the means of provoking further public efforts to eradicate the scourge of phthisis, which they had now been taught was not one of an hereditary nature to which they must calmly submit, but one that might be tackled and subdued. Lieutenant-Colonel Montefiore endeavoured to point out in his paper that the "colony" system was the wisest upon which to establish sanatoria for the poorer sufferers, and he mentioned what had been done to give the poor the benefit of the open-air treatment by the London hospitals for consumption and by private philanthropic endeavours. He also showed some of the difficulties which beset the charitable worker in assisting the phthisical poor under the new condition.

Dr. BONNET-LÉON (Paris) explained the function of the anti-tuberculous dispensaries in France which as far as possible gratuitously provided to the poor—(1) education for the prevention of tuberculosis; (2) medical advice in as early a stage as possible; and (3) necessary assistance, especially in the proper providing of food. The results of these were highly satisfactory.

The Rôle of the Consumption Hospital in the Prevention and Treatment of Consumption.

Dr. J. EDWARD SQUIRE, physician to the North London Hospital for Consumption, communicated a paper upon this subject in which he said that for the cure of tuberculosis of the lungs hospitals for consumption were useful in proportion as admission was not restricted to the early cases. The hospital, to be complete, should provide for all stages of the disease—for those persons who with medical assistance could continue at work and also for those who were past work and past cure. To fulfil these requirements the hospital should have several departments: 1. Dispensaries or out-patient departments situated in the more crowded districts where tuberculosis was prevalent. The prophylactic rôle of this department in teaching patients how to prevent infection was as valuable to the community as the treatment was to the individual patient. 2. In-patient departments in some healthy situations removed from, but within easy access of, the poorer districts from which cases would be derived. Here amelioration rather than cure was the main aim, but the temporary isolation and the education of the patient in preventive requirements were valuable in prophylaxis. 3. Sanatoria in the country to which curable cases could be drafted for more prolonged stay than could be permitted in the hospital itself. The education in practical hygiene which patients received during residence in the sanatorium had far-reaching influence in prevention. 4. Homes for advanced consumptives which were practically isolation hospitals for the most dangerous class of cases who from poverty would otherwise be living under conditions in which the risk of infection would be greatest or who would be admitted into general hospital wards or poor-law infirmaries to the danger of other patients.

Dr. CALMETTE (Paris) communicated a paper upon Urban Dispensaries for the Prevention of Tuberculosis among the Working Classes, and was followed by Dr. L. PETIT (Paris) who described the Sanatorium of Mont des Oiseaux. Dr. SIEGMUND MORITZ (Manchester) detailed the routine of Treatment at the Manchester Hospital for Consumption and Diseases of the Chest, and was followed by Mr. E. T. HALL, F.R.I.B.A., who laid down the main lines on which a sanatorium should be constructed with regard to site, elevation, and sewage disposal, and described the buildings at Harlaching (Munich), Falkenstein, Rupertshain, the Nurnberg Heilstätte (Engelthal), the Volksheilstätte Krailing (Planegg), Nordrach, Crookesbury Ridges, and Pine Wood. He also gave a description of the new sanatorium which is about to be erected at Frimley from his designs in connexion with the Brompton Consumption Hospital.

SECTION II.

MEDICAL, INCLUDING CLIMATOLOGY AND SANATORIA.

THURSDAY, JULY 25TH.

Sanatoria for Consumption.

The work of the section was punctually resumed by the delivery of an opening address by Professor CLIFFORD ALLBUTT (Cambridge) on the subject of Sanatoria for Consumption. The speaker began by pointing out that though the modern open-air treatment of phthisis might, perhaps, be successfully accomplished at home the method needed the supervision of a medical man with practical experience of the treatment as carried out in sanatoria. The effect of cold air was to increase the appetite and it did away with the necessity for forced feeding. The valuable scientific work carried out at sanatoria should be systematically calculated and utilised. The degrees of cure were three—arrest, obsolescence, and *restitutio ad integrum*. Obsolescence required two winters and one summer and was out of the question for the poor. To secure what might be called an "economic cure" six months would be necessary in the majority of cases. The dulness and emptiness of the lives of patients at sanatoria should be remedied by tranquil occupations and suitable forms of amusement. Professor Allbutt put the following questions to the meetings: Can mixed infections be inferred from fever curves? Is it possible to distinguish between economic cure and complete cure? How long is a febrile patient to be kept in bed in the reasonable hope of recovery? What can be based upon physical signs alone in regard to prognosis? Is multiple tuberculosis a condition too far gone for treatment in a public sanatorium? Of what use, if any, is massage or hydrotherapeutics? Are pulmonary gymnastics of use, if so, when and how?

Dr. J. KINGSTON FOWLER (London) said that the treatment of the tuberculous patient could not be carried on at home. Further researches on metabolism were requisite to enable them to say definitely what should be done in feeding patients. Early treatment was advisable and this was shown from the large proportion of post-mortem examinations disclosing tuberculosis arrested in the early stages and the small proportion found where a cure had taken place in the advanced stages of the disease.

Dr. R. W. PHILIP (Edinburgh) pointed out that the temperature of the ward was best kept not too high. As a matter of fact patients did better in the winter than in the summer. The study of the temperature and pulse should guide the amount of exercise. Patients, if possible, should be treated in their native air.

Professor SCHRÖTTER (Vienna) explained that in Austria before sending patients away they were kept under observation at a central sanatorium and then their ultimate destination was decided upon.

Dr. DVORAK (Prague) urged that tuberculous patients should be relegated to isolated pavilions.

Dr. JANE WALKER (London) insisted that the mental condition of the patients should be considered as well as their physical condition. Hospital patients could be employed in the domestic service of the institution.

Professor JANEWAY (New York) said that it should be the duty of the State to prevent infection from tuberculous patients sent into the country. More exactness in the diagnosis of the early signs and symptoms of phthisis was required from the medical man.

Sir HERMANN WEBER (London) advocated a system of transition sanatoria and discussed the subject of gout being a favourable complication of the disease.

Sir HERMANN WEBER also read a paper entitled a Plea for Seaside Sanatoria for Children especially for the Prevention and Treatment of Scrofulous Complaints. In former times, he pointed out, the so-called scrofulous diseases were much discussed by the medical profession and the public, but now comparatively little attention was paid to them, while the more fatal pulmonary tuberculosis commanded general attention. Yet there was good reason why scrofulous affections should in an equal measure engage their sympathy and attention, firstly, because they were likewise of tuberculous nature and intimately allied to other forms of tuberculosis, and often led to pulmonary or to acute meningeal tuberculosis; and, secondly, because they caused infinite suffering and misery to the patient and often death or invalidism or a crippled state for life. By treating scrofulous affections they therefore not only endeavoured to cure the existing diseases but also to prevent pulmonary tuberculosis. The principal means of cure were life in the open air, good food, hydrotherapeutic measures, active or passive exercise, and surgical treatment. These measures could not be carried out at the homes of the children of the poor, and frequently even not at the hospitals of large towns; but in the pure air of the seaside (and

also of inland places, especially at high elevations) the treatment, if commenced early, almost always resulted in complete cure. Those who were rich could make the most necessary arrangements in private houses or establishments, but the children of the poor had no chance excepting in sanatoria, and for the majority of them sanatoria at the seaside were preferable to those inland, on account of the more vivifying effect of the sea air, which underwent constant changes by the regular local currents of air and by the stronger general winds, and on account of the facility of bathing in the open sea or in tepid sea-water. The poor children who were most benefited and who specially required the sanatorium treatment were those recovering from acute fever, those affected with deficient nutrition, anæmia, rachitis, scrofulous and tuberculous swelling of the lymphatic glands, a scrofulous inflammation of the skin or joints, including hip-joint disease and Pott's disease, and sufferers from adenoid affections of the throat and nose. For the treatment of the majority of these cases it was not sufficient to use any ordinary house—a properly arranged sanatorium was required. The number of children who required sanatorium treatment at the sea-side was very large, and the number of beds available for them in England was very small. There were perhaps 300 beds in the sea-side sanatoria of England, while 5000 would certainly not be too many. Every hospital for sick children ought to have a sea-side branch. It was almost incredible that there should be this strange defect in the hospital accommodation of England, especially when they reflected that the whole of the United Kingdom had such splendid sea-coasts and when they further considered that England was the first country to awaken to the great importance of this matter by establishing, on the suggestion of Dr. Lettsom and Dr. Latham, the General Sea-bathing Infirmary at Margate in 1791. The crying need for help and the possibility of affording this help must be unknown to the philanthropists of this country. If they were aware of the great sufferings which the poor children affected with Pott's disease of the spine, with hip-joint disease, with caries of bones, or with tuberculous inflammation of joints underwent in their wretched homes and how large a proportion of them became consumptive later or cripples for life, or died after protracted misery, and if they knew at the same time that the majority of them could be cured entirely and that many of the others could be restored to such a condition that they could earn their bread and could enjoy life, provided that they were sent early enough to sea-side sanatoria, many philanthropic persons would surely assist in supplying means to found numerous such establishments.

Dr. KNOPF (New York) recommended that patients should not be sent to sanatoria too far away from home because homesickness was a factor in delaying recovery.

Dr. W. V. SNOW (Bournemouth) advocated the treatment of tuberculous patients in sanatoria before any attempt was made at home treatment because of the advantage of learning discipline and proper management.

Dr. ROSENTHAL (Copenhagen) suggested that country hospitals should be utilised for the open-air treatment while sanatoria were being erected.

Dr. BURTON-FANNING (Norwich) discussed the value of rest for tuberculous patients; this with good nursing and attention to diet resulted in 92 per cent. of the cases in an institution which he was interested in gaining weight. One of the most unfavourable signs was frequency of pulse without fever.

Dr. WOLLF BECHER (Berlin) said that in Berlin there was provided for the poor a day sanatorium in the woods outside the town.

Mr. C. BRAINE-HARTNELL discussed the importance of noting the temperature after exercise and how long it remained high, stating that it should fall within 30 minutes. The rectal temperature was very useful as it showed variations which might otherwise be overlooked.

Dr. A. R. PARSONS (Dublin) put forward his views in regard to the possible inutility of the sanatorium treatment for the very poor. The value of the treatment depended to a certain extent upon the amount of time given to it.

Sir R. DOUGLAS POWELL, in the absence of Professor Clifford Allbutt, closed the discussion and commented on the necessity of recognising the fact that tuberculous patients required something in which they could take a little human interest.

FRIDAY, JULY 26TH.

There was no discussion in this section on Friday, but several papers of interest were read, of which we give *résumés*.

Dr. E. SYMES THOMPSON, consulting physician to the Hospital for Consumption, Brompton, read a paper with the following title:—

The Open-air Treatment in Institutions and in Nursing Homes.

He pointed out the difficulty, often insurmountable, of carrying out the "open-air treatment" in the houses of the patients, giving reasons for this want of success. He showed that balconies and "shelters" were superior to rooms even when the windows were reversed. He gave suggestions and details of treatment as regulated (1) by temperature charts by which the rectal and mouth temperatures were compared, because the mouth temperature was not an adequate guide for treatment; (2) by watchful consideration of respiratory movements; and (3) by discriminating attention to the digestive system. Whilst affection of the larynx was a late manifestation of tuberculous disease, pharyngeal affection was an early, often the earliest, symptom. Indeed, in very many cases the tubercle thus gained access to the system, and it was in cases of tuberculous pharyngitis prior to the development of lung affection that careful local and constitutional treatment in a nursing home often proved of the greatest prophylactic value. Whilst foreign health resorts retained their value in many cases English resorts for open-air treatment, and especially those at the sea-side, were, he considered, of equal value in some, and of greater value in other, conditions. The paper concluded with a condensed record of a series of 16 cases, from which the deduction was reached that in rapid cases (galloping consumption) nursing home treatment was the best. In many slight cases the evil was arrested in such homes more successfully than in other ways, and in advanced cases of long standing lasting benefit was often thus recorded.

Dr. W. EWART, senior physician to St. George's Hospital and to the Belgrave Hospital for Children, read a paper entitled—

Time-saving Methods of Treatment, with a Preliminary Note on the "Silver Treatment" of Phthisis by Intravenous Injections of Protargol.

A strong plea, he said, should be entered in the interest of the rate-paying public as well as of the patients for an adequate inquiry into the comparative capabilities of the various "cures" now available. Early and mild cases in strong subjects were practically self-curable with an open-air life; but with the large group of pyrexial, sub-pyrexial, or more or less chronic phthisis the open-air treatment, at any rate in this country, and also the climatic treatment, it would seem from Alpine experience, were not the shortest ways to a cure. A good deal of catarrh was remediable by what may be termed the hospital treatment, or "thorough" treatment, the object of which was to rid the case as soon as possible of its dangerous complications—bronchitis, catarrh, caseation, and suppuration—whilst utilising the period of unavoidable confinement in bed, in the ward, or in an even temperature for the application of every therapeutical influence which in the individual case might be profitably resorted to. This idea had been recently carried out with an encouraging degree of success in a limited number of cases. The favourable results obtained had demonstrated to his satisfaction the advantage of not sending the patients to the open air prematurely, but only in a convalescent state. He was not acquainted with the latest development of Dr. R. Maguire's formaldehyde injection treatment, but some of the results obtained with the original method were very favourable, although neither by this nor by any other method had a permanent clearance of the bacilli from the tissues been obtained. He was led to substitute protargol for formaldehyde by the conspicuous success of the administration of nitrate of silver in pneumonia (Caccianiga) and of its subcutaneous injection in phthisis (Mays). Pending the discovery of some better remedy he had provisionally adhered to it in preference to formaldehyde because of its more decided, of its more rapid, and of its more lasting action. The clinical effects resembled those obtained by Dr. Maguire with formaldehyde—viz., a remarkable subjective feeling of improvement coinciding with manifest improvement in aspect and in strength, a

rapid diminution in the cough and in the expectoration, and a more or less rapid change from the dense sputum of phthisis to simple catarrhal sputum and ultimately to hyaline mucus. The ultimate effect was to lower the temperature, but meanwhile the level might be disturbed by elevations incidental to the treatment. More often than not the injection was followed after one hour by a chilliness or even a rigor and a sharp rise lasting about half an hour. After this had passed off the patient felt and continued to feel remarkably well; no untoward symptoms of any kind had followed the injections. A short attack of nephritis occurred in one patient, but this seemed to have been occasioned by a chill. Pre-existing albuminuria of long standing was much reduced in one of his cases; in another the first injection succeeded in stopping a rebellious hæmoptysis. The injection consisted of 40 cubic centimetres of saline solution containing from one and a half to two and a half grains of protargol, and this was preceded and followed by an injection (through the same needle) of a few cubic centimetres of pure saline solution to obviate leakage of irritating fluid into the tissues; from 12 to 15 injections generally sufficed. It was best to administer them at intervals of one day, but in some cases they had been given daily. The protargol injection method had yielded by itself satisfactory results, but it did not claim to be more than the first and most important instalment in an extensive system of active treatment. His present practice was to combine with it, as soon as the case had lost all acuteness, general massage, gentle exercise, and particularly respiratory exercise for the expansion of the lung, strong diet and nutrient adjuncts, local and general treatment of the skin, and suitable internal remedies, among which he had obtained specially good results from ichthyol, originally recommended by Wertheimer. This combined treatment had enabled some patients with originally unfavourable prognosis to become, after a very few weeks' stay in the hospital, quite suitable for the open-air treatment, and to return, after a short period in the country, greatly improved and with a promising forecast of ultimate recovery.

Dr. A. BÉCLÈRE (Paris) read a paper on

The Technique of the Application of the Roentgen Rays in the Diagnosis of Tuberculosis.

The subject under examination should recline on his back or be seated on an elevated chair, the height of which could be regulated like a music stool, and having the shape of a bicycle saddle, so as to permit of almost complete extension of the thighs over the pelvis. The observer, to be in possession of a high degree of sensibility to the light, should stay some minutes in the dark before commencing radioscopic examination. Precise measurements had taught him that after staying for ten minutes in darkness the sensibility of the retina to the light of the fluorescent screen became from 50 to 100 times greater than it was before; it became about 200 times greater after 20 minutes' darkness, and when this time was passed it increased still more. It was desirable that the generator of electricity for supplying the Crookes's tube should have a certain power, but it was not necessary that this power should be very great. He used a small Wimshurst's static machine with four plates. The machine could be put in motion by the hand, with a crank, and being not too large it was very easily transportable; it was good enough to furnish to an eye, sufficiently prepared by darkness, an excellent representation of the thoracic organs on the fluorescent screen. On the other hand, it was indispensable that the power of penetration of the Roentgen rays, varying as it did with the electrical resistance of the Crookes's tube, should, all things being equal, be exactly adapted to the luminous sensibility of the observer. In the course of prolonged radioscopic examination the electrical resistance of the tube should diminish in proportion as the luminous sensibility became greater. Measured by the duration of the equivalent spark by means of the *spintermètre* (the small instrument he had had constructed for this purpose), it would diminish from about nine centimetres to three centimetres or less. For this reason the tubes furnished with a vacuum regulator were preferable to others, for in these a person could vary at will, according to the degree of vacuum, the electric resistance and consequently the penetrating power of the rays. It was equally indispensable that the tube should be easily moved and capable of being placed over any part of the thorax which the observer wished. This condition was fulfilled by the frame for carrying the tube which he had had constructed for the purpose. But it was necessary, above all, to be able to restrict at will the divergent bundle of Roentgen rays which traversed the thorax so as to confine the surface illuminated by the screen; by this means were increased considerably the sharpness of outline and the definition of details in the radioscopic image of the region which the observer particularly wished to examine. To this end he had had constructed a disc of lead with a variable aperture, which was a simplification of the iris-diaphragm of microscopes. This diaphragm, close in front of the Crookes's tube and moveable with it, was completed by a small instrument—the incidence indicator—which showed at each instant, in the course of radiographic examination, what was the position of the tube and the attitude of the patient and the point of the screen on which the rays impinged at right angles; it was in the immediate neighbourhood of this point, called the *point of normal incidence*, that the radiographic image approached most closely in form and dimensions those of the corresponding organ. Thus in the radioscopic examination of a patient attacked by, or suspected of, tuberculosis they commenced by taking a general view of the thoracic organ, by enlarging to the maximum the opening in the diaphragm; then they pulled out the tube in such a way that the normal ray of incidence traversed the apex of the chest, then they narrowed the opening in the diaphragm until no more could be seen on the screen than the supra-clavicular regions of the two lungs. Lastly, he varied the electric resistance of the tube, and consequently the penetrating power of the rays, so as to obtain the greatest contrast possible between the clear and obscure parts in the radioscopic image. Such were the conditions which rendered radioscopy as applied to the diagnosis of incipient pulmonary tuberculosis more exact and more certain.

Dr. BONNET-LÉON (Paris) read a paper on

The Use of Roentgen Rays for Diagnostic Purposes in Pulmonary Tuberculosis,

in which he presented the results of more than 600 personal observations. Most of these cases were examined from 1897 up to the present time and had been as a preliminary submitted to the auscultation of various of his colleagues. By the use of the fluorescent screen alone the diagnoses were confirmed in 98 cases out of 100, and very frequently even at the very outset of the disease. He recommended the method when a large number of patients were to be examined at a time in noisy places and described a new process by which, he said, an easy and almost general diagnosis could be made in the pre-tuberculous period when neither screen examination, radiography, auscultation, nor the microscope revealed the least opacity, the smallest modification of the vesicular murmur, or the bacillus. He laid stress on the diagnostic importance of anomalies in the synchronism and amplitude of movement of the two halves of the diaphragm in their rise and fall, and concluded by expressing an opinion that a radioscopic examination should be made of all patients predisposed to tuberculosis by heredity, alcoholism, contagion, or surroundings. From a therapeutic point of view he would prescribe the methodical exercise of the diaphragm and the muscles of inspiration by respiratory gymnastics in accordance with the results of the radioscopic examination.

Dr. ESPINA Y CAPO (Madrid), Professor in the Provincial Hospital of Madrid and Inspector of Public Health, read a paper on the same subject in which he said that radioscopy as a means of diagnosis in tuberculosis constituted one of the means of which the greatest hopes had been formed. In the Congress held in Paris they could not speak so affirmatively as they could now because they were not then in possession of positive instances which would leave no room for doubt. Radioscopy, in the case of tuberculosis, served as a potent means of settling the topography of the lesions. Also by radioscopy the movements of the diaphragm, both in inspiration and expiration, could be appreciated. These movements under normal conditions were not so rhythmical and symmetrical on both sides in tuberculosis. In tuberculosis the diaphragm did not rise to the same height on the sick as on the healthy side, and when the two lungs were affected the ascension was shorter on the worse side. Dr. Espina y Capo concluded by pointing out the different uses to be made of radioscopy and radiography and explaining the technique that he preferred.

Dr. ALLEN T. HAIGHT (Chicago) made a communication upon

Tuberculosis of the Eye,

in which he pointed out that the history of tuberculosis in the various parts of the eye was very interesting. Ocular

disease he considered to be often the earliest manifestation of tuberculous affection, and in support of this view he quoted numerous authorities and conclusions, with many tabulated and published cases. He concluded that in some cases early enucleation of the affected organ would save many lives.

Dr. ALBERT JOSIAS, physician to the Hôpital Bretonneau at Paris, and Dr. JEAN CH. ROUX, ex-intern of the Hospitals of Paris, communicated a paper on

The Treatment of Pulmonary Tuberculosis in Children by Raw Meat and Muscle Serum, according to the Method of M. Ch. Richet and M. Héricourt.

They had carried out the treatment by raw meat and muscle serum, as described by M. Richet and M. Héricourt, in a series of tuberculous children. Each of the patients received daily the expressed juice of 500 grammes of raw meat; cooked meat was banished from their diet and an equal quantity of raw meat was substituted. Treatment was strictly maintained for months, and in some cases for nearly a year. Sixteen cases of pulmonary tuberculosis were investigated in this way, but of this number four had been left out of account, as they had only been under treatment for a few weeks. The course of the remaining 12 had been followed with great care, observations being made almost daily, and the results were very accordant. In only one case was the patient in the first stage of the disease (consolidation of the apex with some crepitation, but no breaking down). This patient was at present cured, her weight had risen by 10 kilogrammes; in seven months she increased from 29 to 34 kilogrammes. Four patients were in the second stage of pulmonary tuberculosis (more or less extensive infiltration, with softening, but no cavities). Two of these could be considered as cured after four months of treatment. In these patients all the signs showing a tuberculosis in process of evolution had disappeared. The condition of one was stationary from the point of view of pulmonary lesions; another patient improved, but left too soon. Seven patients were in the third stage of pulmonary tuberculosis (infiltration with softening and cavities). The general condition of six of these was bad, and they were near the terminating period of the disease. In spite of treatment they grew worse, and death supervened in a period of time varying from one to three months after the inception of alimentation by raw meat. One little girl only, in spite of advanced lesions and a cavity in the left lung, maintained a good general condition. After 10 months of uninterrupted treatment she was evidently on the way to improvement. Their conclusions could but confirm what they had said in a preceding paper. So long as they had to deal with a purely tuberculous lesion the patient markedly improved under the treatment; auscultation revealed an arrest of the tuberculous process, and the patient recovered. While saying, however, that the cure could become permanent, it must be remembered that the future of the patients was the sole criterion of their complete recovery. But when the tuberculous lesion was invaded by microbes which grew in the softening lungs and in the cavities, when the organism was radically affected by toxins circulating in the blood, treatment such as they had carried out had no longer any therapeutic effect in the large majority of cases.

Dr. R. MAGUIRE (London) then read a paper upon

The Inhalation of Formic Aldehyde in the Open-air Treatment of Pulmonary Tuberculosis.

A great amount of experimental work, he said, had been carried on on the continent, in America, and in England, which went to prove that formic aldehyde was a powerful antiseptic and germicide, its bacterial action being equal to, if not greater than, that of bichloride of mercury. It was, he thought, rapidly superseding the older antiseptics, such as carbolic acid, perchloride of mercury, and others. Its advantages were: (1) it was non-poisonous and non-corrosive; (2) it could be used in the form of vapour, which, being of low specific gravity, was diffusible and mixed well with the air; (3) it had no action on clothes, textile fabrics, leather goods, and general household articles, or on metals, except iron and steel; and (4) it was easy and clean in its application, could be used as a general antiseptic and deodorant, and in the disinfection of rooms. About two years ago in the course of some experiments the author made the following observations. 1. Linen strips dipped in broth cultures of staphylococcus pyogenes aureus and exposed in a sealed room with a capacity of 2000 cubic feet to the vapour generated from 20 paraform tablets showed no growth after six hours. 2. From ½ to 1 per cent. formalin solution killed a pure culture of staphylococcus pyogenes aureus, bacillus anthracis, bacterium coli commune, and bacillus typhosus within from 30 minutes to an hour. And ever since he had found formaldehyde to be most efficient and reliable in the disinfection of rooms in the sanatorium with which he was connected. He began treating his patients, he said, with the drug in 1899, and had published the results of seven cases of which three were cured, two were benefited, while in two others the results were not conclusive. He now wished to record the results of 15 cases. Of these 15 patients five (all men) were completely cured. No physical signs or bacilli were found when they left. They had ever since continued to be in good health. Seven (six men and one woman) were almost cured—i.e., a few dry crepitations and a few bacilli remained when they left, but they had been in good health and had followed their different avocations. One (a woman) was slightly benefited. In the rest it had very little effect. Of the five who were completely restored to health three had affection of one lung, one had a large cavity in the left apex, and the other had marked signs of breaking down of both lungs. Of the seven who were nearly cured two had cavities of one lung and consolidation of the other, one had empyema complicating pulmonary tuberculosis, and the rest had more or less extensive affection of both lungs. After describing the technique employed Dr. Maguire concluded as follows:—1. The results of the treatment to his mind had been very satisfactory, and he would strongly urge that the drug should be given a fair trial in every sanatorium where the open-air treatment was carried out. 2. It should be systematically and persistently used and someone enthusiastic in the treatment should take charge of the apparatus—for the apparatus required to be kept clean and the lamp, &c., needed careful supervision every day; any neglect would bring about indifferent vaporisation and the results would be more or less a failure. 3. Though formaldehyde was non-poisonous it hastened coagulation of blood. Hence the injection of formalin directly into the veins and tissues of the body complicated the process of treatment and added a certain amount of risk. Besides, it was not necessary as the efficacy of the drug could be equally obtained by simpler methods of some form of inhalation already discussed in the paper.

Papers were also read by Dr. CERVELLO (Palermo), on the Value of Igazol, a preparation containing Formaldehyde; by Dr. CHOWRY MUTHU (London), on the Therapeutics of Formaldehyde; by Dr. HUGH WALSHAM (London), on the Use of the Roentgen Rays in the Diagnosis of Tuberculosis; and by Dr. STCLAIR THOMSON (London), on the Treatment of Tuberculous Laryngitis.

The closing incident in the last session of this section arose from the sad loss lately suffered by the President, Sir Richard Douglas Powell. After Dr. THEODORE WILLIAMS had made a sympathetic reference to the calamity that had befallen their President, Sir J. W. MOORE (Dublin) proposed and Dr. DENISON (Colorado) seconded the following motion which was unanimously adopted:—

That Section II. desires to express its high and grateful appreciation of the able, dignified, and courteous manner in which Sir Richard Douglas Powell has discharged his presidential duties under most trying and regrettable circumstances; and the Section would convey to Sir Richard and Lady Douglas Powell an expression of its deep sympathy with them on the occasion of the death of their soldierly and heroic son in the South African campaign.

SECTION III.

PATHOLOGY, INCLUDING BACTERIOLOGY.

THURSDAY, JULY 25TH.

This section resumed work under the chairmanship of Professor G. SIMS WOODHEAD.

Professor C. BENDA (Berlin) opened a discussion on

The Varieties of Tuberculosis.

These, he said, depended first upon the character of the organism and secondly on the mode of dissemination. Tuberculous periangeitis began outside contiguous vessels. Endangeitis was from within and spread longitudinally. The fresh tubercles arising in the course of the chronic disease were from chance tubercle bacilli carried by the blood.

Professor D. HAMILTON (Aberdeen) said that it had to be decided whether the mucous membrane of the stomach was

able to absorb the bacilli and to pass them on to the glands without itself becoming tuberculous.

Dr. HABERSHON (London) said that two of the chief paths of entrance were the tonsils and the lower part of the small intestines. Differences in appearance of the tuberculous lesions were from a difference in virulence of the bacilli.

Professor OSLER (Baltimore) felt certain that the frequency of tuberculous pericarditis was directly in proportion to the care with which it was sought.

Sir CHRISTOPHER NIXON (Dublin) thought that the virulence of the bacilli caused the different pathological conditions known as tuberculosis. Occasionally tuberculosis arose in man from cattle.

Professor ADAMI (Montreal) thought that there was a constant physiological passage of bacteria through the tonsil and intestine. This explained how tubercle bacilli could be absorbed.

Professor MUIR (Glasgow) said that pulmonary lesions did not necessarily indicate that the disease was produced by inhalation, nor did the absence of lesions in the intestinal mucous membrane prove that infection had not occurred by that mode of entry.

Professor HEYMANS (Ghent) gave his experiences upon the diazo reaction in cases of tuberculosis in animals which were not altogether satisfactory.

The Comparative Virulence of the Tubercle Bacillus from Human and Bovine Sources.

Dr. M. P. RAVENEL (Philadelphia) then read his communication based upon three years' experiments with bovine and human tubercle bacilli. The experiments were of a very exhaustive nature and carried out with extreme care and efficient control. His conclusions in view of the statement of Professor Koch are extremely important and are as follows. The bacilli from the two sources had in culture a fairly constant and persistent peculiarity so that they could be tentatively differentiated. The bovine bacillus was for all experimental animals with the exception of swine more virulent than was the human bacillus. It was a fair assumption from the evidence which he produced, and in the absence of any definite evidence to the contrary, that the bovine tubercle bacillus had a high degree of pathogenic power for man which was especially manifest in the early years of life. In justification of the last deduction he quoted five cases of tuberculosis in human subjects which were directly derived from bovine sources.

Professor SIMS WOODHEAD thought that as the time for terminating the meeting had come and as the communication of Dr. Ravenel was of such great importance he should defer the discussion on the paper until the following (Friday) morning.

FRIDAY, JULY 26TH.

The Temperature Required to Kill Tubercle Bacilli in Milk.

Professor BANG (Copenhagen) addressed the section on the subject of the temperature required to kill tubercle bacilli in milk. His view was that anything under 85° C. was not certain to destroy the bacilli though it might be possible. He concluded his very remarkable communication by explaining how the froth on the milk was below the temperature of the milk itself and thus the chance of infection might still remain.

Professor RUATA (Italy) took up the point that tuberculosis was admittedly a chronic malady, and that being so he came to the conclusion from the fact of the great number of deaths recorded from tuberculous enteritis and meningitis before infants had reached the age of two months that therefore milk ought not to be regarded as being so common a cause in spreading the disease.

Dr. KOSSEL (Berlin) said that to sterilise milk they must use a temperature of 90° C. and this did not in any way interfere with the making of butter and cheese.

Professor S. DELÉPINE (Manchester) considered that the necessary temperature was near 100° C. By experimental inoculation it could be shown that lower temperatures only caused delay in the symptoms of tuberculosis becoming manifest.

Dr. MARMOREK (Paris) gave it as his opinion that tuberculous meningitis must be secondary to some preceding tuberculous lesion and discussed the comparative immunity of the dwellers among the Alps who used large quantities of milk, but that milk came from the purest sources.

Mr. H. A. KINGWELL (London) said that much American meat arrived in this country infected with tubercle and with cysticerci, but Dr. RAVENEL did not agree to his statement that it was not difficult to find cysticerci in pig's flesh.

A discussion on

Mixed Infection in Tuberculosis

was opened by Mr. A. G. R. FOULERTON (London), bacteriologist to the Middlesex Hospital, who pointed out that the influence exerted by secondary infections on the course of tuberculosis began to attract attention as soon as the identification of the specific parasite enabled the pathology to be studied. In chronic pulmonary tuberculosis and in chronic pulmonary phthisis there could be no question as to the cardinal part which the bacillus tuberculosis played as a primary or original factor, but its importance as an ultimate factor in the mortality was not by any means so well established. The terms "chronic pulmonary tuberculosis" and "chronic pulmonary phthisis" were used in clinical medicine as if they were synonymous, but pathologically the two conditions differed widely. In chronic pulmonary phthisis the action of the bacillus tuberculosis had added to it the more acute influence of pyogenic organisms, the potentiality of which for evil was incomparably greater. By uncomplicated chronic pulmonary tuberculosis Mr. Foulerton understood the condition in the lungs which was brought about, usually in adults, by the presence of the bacillus tuberculosis alone and in which a limited number of granulomata were present. In such cases physical signs were most frequently absent and the discovery of the infection by the finding of bacilli in the sputum was usually a matter of accident. This condition must, however, in reality be extremely common, and its frequency might be estimated from the number of instances in which the lesions of arrested tuberculous infection were found in the lungs of adults dying from other causes. With respect to the secondarily infecting bacteria of chronic pulmonary phthisis, practically all who had worked at the subject were agreed that various species of cocci were the predominating organisms, streptococcus pyogenes, staphylococcus pyogenes aureus, staphylococcus pyogenes albus, diplococcus pneumoniæ, and micrococcus tetragonus being found most frequently. The pathogenic action of the secondarily infecting bacteria consisted chiefly in local destruction of the tissues, the production of perinodular pneumonia, and the setting up of toxæmia. The treatment of secondary infections in pulmonary phthisis should be the chief object aimed at. Under the influence of rest, and in an atmosphere of pure air, such as might be found at moderate altitudes, the virulence of pyogenic bacteria became attenuated and tended to die out.

Professor WILLIAM OPHÜLS's (San Francisco) paper on the same subject was then read to the meeting. He had succeeded in finding pure cultures of tubercle bacilli in seven out of 18 cases of large cavities. Tubercle bacilli alone could be found in 25 cases of tuberculous pneumonia. In 12 cases of recent mixed infection there were tubercle bacilli with pneumococci, streptococci, or staphylococci. There was a general infection in six cases of mixed infection, where the pyogenic cocci were held to have caused acute septicæmia, being the immediate cause.

Dr. W. BULLOCH (London) suggested a joint committee of research by clinicians, pathologists, and bacteriologists to investigate and to report.

Dr. F. F. FRIEDMANN (Berlin) gave details of some experiments proving that a fœtus could contract tuberculosis from the paternal side without the mother being affected.

Dr. HUGH WALSHAM (London) read a paper on

Excretion Tuberculosis of the Kidney.

Excretion tuberculosis of the kidney, he said, was defined as the occurrence of secondary tuberculous foci by a process of excretion through the glomeruli and the bacilli had become arrested at some point in the tube, most often in the medulla of the kidney. 13 cases of disseminated miliary tuberculosis had been examined in proof. All tubercles that had advanced to the stage of giant-cell formation had to be rejected. In the vicinity of the giant cell the action of the bacilli appeared weakest and the bacilli found in the neighbourhood of giant cells were usually few on account of the phagocytic action of the giant cell on the bacilli (Metchnikoff and Stschastny). The view that giant-cell formation in renal tuberculosis was derived from renal epithelium was untenable. Very little was said by the authors of text-books on pathology as to the exact position of the bacilli in miliary tuberculosis of the kidney. The only British pathologist who mentioned the position of the bacilli was Hamilton whose description

was very accurate. Details were given of the microscopical examination of tuberculous kidneys by serial section in four cases. The bacilli which gave rise to the process were found in the urine tubes only, or in process of expulsion through the tubes. It seemed probable that other pathogenic bacilli and cocci were excreted by these organs. Horton-Smith had admitted the possibility of a typhoid bacillus finding its way through the kidney to multiply in the bladder. Plate 10 of his (Dr. Walsham's) series illustrated a case of septicæmia. Two of the urine tubes were seen to be stuffed with micrococci; the surrounding tissue was free from them, but was infiltrated with pus cells. The experimental production of renal tuberculosis was discussed, especially Borrel's and Wyssokowitsch's experiments. One of the speaker's own plates (Plate 11) seemed to show a glomerulus in process of excreting the bacilli. Tubercle bacilli arriving by the renal artery either became arrested in the capillaries of the glomeruli or in a small twig of the renal artery, and here in most cases tuberculous changes arose. A possible cause of the non-excretion of bacilli (evidence of excretion being found only in four out of 13 cases) was the hindrance caused by large caseous foci of tubercle. If, as frequently happened, large foci of tubercle were found enclosing apparently normal urinary tubes which contained no bacilli, notwithstanding the quantity in the neighbourhood, it might be assumed that the bacilli had been conveyed by the blood or lymph-vessels. If, on the other hand, tubercle bacilli were found in a urinary tubule with little surrounding caseation the conclusion was that the bacilli did not enter the tube from the surrounding tissue, but produced the tuberculous nodule while in process of excretion by the kidney. The following conditions had therefore been shown. 1. The presence of tubercle bacilli within the glomeruli of the kidney without any visible change in the vessels of the glomeruli in the surrounding tissue. 2. The presence of bacilli in the urine tubes. 3. The presence of tuberculous changes in the neighbourhood of the bacilli in the tubes (tubercles of excretion). 4. The presence of bacilli in the urine of a patient who died from acute miliary disseminated tuberculosis.

The subject of the Transmission of Tuberculosis by Sipping Wine from the Same Vessel at the Communion was mentioned by Mr. HERBERT MORGAN and the Danger of Infection from Railway Carriages was dealt with by Dr. BROOK HUNT.

SECTION IV.

VETERINARY (TUBERCULOSIS IN ANIMALS).

THURSDAY, JULY 25TH.

Tuberculosis and the Milk-supply.

The discussion on this subject was opened by Mr. JAMES KING, Chief Veterinary Inspector to the Corporation of the City of London, whose important paper will be found in THE LANCET of July 27th, p. 245.

Sir GEORGE BROWN spoke on the necessity of stimulating the authorities to further legislative action, but he did not know how to do it, and if anyone possessed the secret he would like to hear it. The majority of meat inspectors throughout the country had not even read the reports of the Royal Commission with its recommendations, and therefore could not be accused of wilfully neglecting them.

Mr. BOWEN-JONES put forward a few propositions which he believed would lead to practical legislation without any great disturbance of the existing law. In order to get that the views approved of must be endorsed and supported by all. No legislation would be founded on any controvertible fact. He thought it absolutely useless to think that tuberculosis could be scheduled under the Contagious Diseases Act. He then detailed his propositions dealing with the meat laws in England. All confiscation should be paid out of the Imperial purse. Preventive measures other than those contained in the propositions should be voluntary.

Mr. HOPKINS praised the manner in which meat inspection was carried on in London, and if it was carried on in the same way everywhere else there would be nothing to complain of. He also thought that compensation should follow confiscation, and this was a great principle which should be demanded in Parliament thoroughly and without any tinkering.

Dr. JAMES CAMERON (Leeds) said that tabes mesenterica was often produced in children from the drinking of tuberculous milk. He also advocated a more thorough disinfection of the byres and other surroundings in which the cows were placed, and concluded with a wish for more unanimity of inspection, referring to the utter incompetency of some of the present inspection. All inspectors should be up-to-date, *bonâ-fide* veterinary surgeons.

Mr. HEADLEY (Northumberland) thought that Professor Koch's announcement had put the clock back 20 years. The county which he represented was the county which suffered most from the ravages of tuberculosis. Northumberland was the biggest cattle producing county, but there was no *bonâ-fide* inspection of meat. He also referred to a local association which compensated the owner by giving him two-thirds of the price of the animal.

Mr. MATTHEW BRECHIN (Glasgow) said that the compensation just referred to could not possibly be adequate. It was as well to remember that Professor Koch might be right and the treatment of this subject should not be too drastic. It was a remarkable fact that Glasgow lost far more meat by condemnation than London did, totally out of proportion to the population. Every butcher should be allowed expert evidence before meat was condemned and no obstacles should be put in his way provided he was carrying on business in a perfectly honourable way.

Professor RUARDI (Italy) said that tuberculous meat must produce first intestinal tuberculosis and secondarily pulmonary tuberculosis. However, an extensive examination of statistics showed that intestinal tuberculosis came on at a time when meat was not eaten—i.e., in infancy. He supported his contentions by referring to English statistics for 1899. In adults tabes mesenterica was secondary to phthisis, and yet meat formed the chief food of the adult. There must be no scientific doubt on any question on which they asked Parliament to legislate. They must remember that in experimenting upon animals the results were not necessarily similar in man. In his opinion inoculation was not of the least importance.

Mr. COOPER (London) said that the population of London had taken every care to see that their inspectors were highly qualified men. In some detail he called attention to the present condition of the law regarding seizures whereby the butcher was practically without means of defending himself from those who probably knew nothing about the matter. He suggested that medical officers of health throughout the country should have a conference and should arrive at a common line of action with regard to the inspection of meat which should be enforced throughout the United Kingdom. At present the law acted very badly and there was a premium for concealment. He showed the folly of following the example of foreign countries, for large quantities of foreign meat exported from abroad were seized as unfit for human food. He also advocated a more natural open-air life for the cows and cattle as being conducive to the best health. In England they might be kept out much longer than they were. At any future conference he suggested that all parties should be properly represented which certainly had not been the case with the Royal Commission.

Mr. PEARSON (Sheffield) said that London was very well circumstanced as regards meat inspection. If the British agriculturist fed his animals he would be at the loss, nor could the butcher afford to buy a "dead" animal. It must be admitted that when the agriculturist interest of the country was good the general trade of the country also was good. He insisted on the necessity of inspection.

Mr. WILLIAM FIELD, M.P., from an exhaustive study of statistics found that tuberculosis as a human disease had decreased by 50 per cent., whereas the amount of meat during the same time that had been consumed by the population had been trebled and he could not see much communicability of tuberculosis through the agency of meat in the face of that fact. The qualifications of meat inspectors had been improved to certain extents since he had brought the notice of the country in Parliament to their total lack of qualification, but the British law on the subject was in a state of confusion at the present time. He regretted that there was no representative of the trade on the Royal Commission. To get effective legislation public opinion must be educated and Parliament must be shown that behind them they had the weight of that public opinion. It would, to insure speedy legislation, be necessary that the cost involved should be as small as possible.

Mr. L. F. COGAN (Northampton) said that the law as regards seizure was just as necessary in the case of pigs, though those animals had not been mentioned. He insisted very strongly on the necessity of the support of the press throughout the country. The choice of action lay between two things: either compensation must be given for destruction of animals in the public interest or the farmer would

have to guarantee that the animals were sound when they were sold.

Councillor ANDERSON, M.D. (Glasgow), said that the principle of compensation was a very serious one, and if once admitted in the meat trade it might be taken as a precedent and applied to a great many other things. Full compensation would have a tendency to create a new class of men who might take unfair advantage of it. In Glasgow they had instituted a meat inspection committee and had made full provision for the defence of the owner of the diseased meat. The public should be protected with as little injury as possible to the trade.

Professor OWEN WILLIAMS (Edinburgh) said that there was not sufficient uniformity of inspection. The veterinary profession was of the opinion that the inspectors should be appointed by Government and not by the municipal authorities. It should be possible for the inspectors to be changed from town to town to avoid local influence. All slaughter-houses should be public. Compensation should not be permanent but gradually diminished and then abolished and finally confiscation should be made punishable after a certain number of years.

The AGENT-GENERAL OF NEW ZEALAND said with regard to the open-air treatment of cattle that tuberculosis was a great pestilence in Queensland and New Zealand, where the herds were out of doors all the year round. In those countries closest Government inspection was required by its veterinary inspector and it was made law that every town of 2000 inhabitants should erect public abattoirs. After slaughtering the meat was subjected to Government inspection. They paid the farmers for the value of the beast if diseased and its flesh was reduced by a steaming process to manure and was not given to pigs, the hoofs and the hides became the property of the Government and were sold for what they would fetch. This arrangement resulted in the farmers inviting the inspection of their animals if they were suspicious.

Mr. W. HUNTING (London) said that the only way to protect the public against tuberculous meat was to make the meat regulations part of a more uniform scheme under the Board of Agriculture for the stamping out of the disease at its source. It was illogical for the butcher to receive full compensation, for if he did there would be no necessity for him to try to control the disease. He thought that Parliament could only be moved in the face of a general election.

FRIDAY, JULY 26TH.

The Legislative and other Measures to Combat Tuberculosis amongst Animals.

The discussion was opened by Professor DUNCAN MCEACHRAN reading a paper on this subject which will be found at p. 279 of our present issue.

Mr. WILLIAM DUTHIE (Collynie Tarves) said that there was nothing more important than the yearly cleansing and disinfection of the byres. A proper system of ventilation was not yet generally understood. He thought that Aberdeen did not allow the cattle sufficient open-air and out-of-door exercise, but better arrangements in this respect were now beginning to obtain. If a cow had udder disease no calf was allowed to suck that animal. He strongly objected to the plan of condemning a valuable carcass for some very small tuberculous lesion, for there was no danger from the meat of such a carcass. If a carcass was destroyed it should be because of general diffuse tuberculosis. The fact that Canada did not give compensation was no reason why the British Government should not give it on a reasonable system.

Professor NOCARD (Alfort) then read a paper on

Tuberculosis in Bovine Animals: its Dangers, its Progress, its Prophylaxis,

in which he came to the conclusion that tuberculosis was one of the diseases of cattle which caused most loss to agriculture in all countries; that everywhere the disease was on the increase, forming everywhere a menacing danger to public health as well as to public wealth; and that infection being the only formidable cause of the increase of tuberculosis there was need for the adoption of legal measures prescribing (1) the complete separation of unhealthy from healthy animals; (2) the slaughtering without delay of those sick animals which showed clinical signs of the disease, and especially of cows attacked with tuberculous mastitis; (3) the interdiction from selling tuberculous animals for a destination other than the slaughter-house; and (4) the pasteurisation of all the sub-products of butter and cheese manufactories. On the risks involved to man from tuberculous animals he came to the following conclusions as to the best means of guarding against them: 1. That the resemblance of tuberculosis in men and in mammals was no longer denied. Healthy cattle-sheds had been infected by lengthened occupation by consumptive cattlemen. The converse was equally possible, at least theoretically. 2. That meat obtained from tuberculous animals was rarely dangerous, and when it was dangerous it was only slightly so. The established regulations for the inspection of tuberculous meat would be sufficient to prevent even the shadow of danger if such regulations were applied always and everywhere, but unfortunately this was not the case. 3. That the milk given by tuberculous cows was rarely dangerous, but when it was dangerous it was most often so in a very high degree; hence the necessity of submitting cow-houses to a periodical inspection when the milk yielded was destined for public consumption. Cows being really only dangerous when they had a tuberculous udder the inspector's attention should be drawn to the state of the udder. Any cow showing clinical signs causing suspicion of the existence of a tuberculous mastitis or of serious visceral tuberculosis ought to be isolated at once pending the making of a diagnosis, this being easily and rapidly done by the present process; the milk should be boiled before being sold or consumed even by the animals on the farm.

Professor THOMASSEN (Utrecht), who spoke in French, cited four cases in which he had inoculated animals with cultures of tubercle bacilli from man, and he ventured to differ somewhat from the statement which had been made by Professor Koch. He also gave a *résumé* of some proposed legislation which was to be carried out in Holland with reference to tuberculosis. Animals affected with tuberculosis were to be destroyed and "reacting animals" were to be segregated. The importation of affected animals was to be interdicted.

Colonel NUNN (London) referred to the universal acknowledgment that it was desirable to eradicate this disease, leaving the matter of communicability out of the question. To an ordinary person the legislation on the matter was misleading. There appeared to be ample Parliamentary powers and it was their duty to educate the people to the point of moving the executive power.

Professor W. A. EDGAR (Dartford, U.S.A.) said that some of the colonies were beyond us in attempting to suppress diseases of animals, although the veterinary profession in this country had long been advocating the enforcement of enactments against tuberculosis. The possibility of accurately diagnosing the disease by tuberculin had removed the great obstacle to the placing of tuberculosis under the Contagious Diseases (Animals) Act and the suppression of the disease. They must take legislative steps without any further delay. Restrictive measures must be universal and uniform and not left to the "may if they think fit" of local authorities. To ensure promptness and to stimulate local interest in the suppression of the disease the powers they had should be administered by the local authorities. He could not agree that it was harmless to allow the skin of a condemned animal to be sold, as it was then used for manure.

Professor DEWAR (Edinburgh) made some remarks in connexion with the suppression of tuberculosis apart from legislation. There was a very exaggerated idea of the expense incurred by any individual breeder who was likely on his own initiative to start to clear his herds of the disease. It was the most profitable thing that a breeder could attempt and he gave figures proving this. Very little faith was now put in the hereditary transmission of tuberculosis.

Mr. W. HUNTING (London) said that there was some but very little legislation against tuberculosis, confined entirely to the protection of man. There was supposed to be some protective legislation against tuberculous milk and meat, but it was not properly carried into execution. Four-fifths of the inspection were done by men who knew nothing about it and the remaining fifth was done by those who knew too much. If it was particularly dangerous to keep a cow with a diseased udder in the shed, was it not more so to leave a lot of "wasters" in the sheds who were emitting bacilli from both ends the whole of their lives? This required legislation just as much as udder disease. The greatest obstacle to legislation was the ignorance of the laity regarding the causation of the disease. At the present time the butcher and the cowkeeper had to pay or be fined for all the tuberculosis which was put into their hands by the breeder and feeder.

Mr. POTTER (Paisley) wanted to know, in view of the

vastly different opinions held by authorities, what education they were going to give the people?

Mr. F. J. LLOYD (London) said that it was absolutely impossible to make cheese from sterilised milk, as had been implied by a previous speaker. With reference to Denmark and the system of pasteurisation the object was to obtain a butter which would be of better and uniform quality for the British market. Persons were always too ready on insufficient evidence to attribute tuberculosis to the milk-supply, but the sterilisation of milk was not only a safeguard against tuberculosis but also against scarlet fever and other infectious diseases, though this was not frequently mentioned. In large towns want of sanitation was a more potent factor in the causation than the quality of the milk. There would not be the present difficulty of teaching the farmers that it was their duty to rid the herds of the disease if the veterinary profession had been of one mind in the past.

Mr. J. S. LLOYD (Sheffield) referred to the difficulty of seeing that ventilation was properly carried out. Meat inspectors should have a thorough training in their duties and should not hold simultaneously such a post as the inspector of nuisances. He regretted that the Meat Traders' Federation had joined issue with the agriculturists in asking compensation for diseased udders, which, in his opinion, with certain restriction was not fair or necessary.

Dr. C. PORTER (Shrewsbury) then read a paper on

The Measures Necessary for Improving Cowsheds and Insuring the Health of Milch Cows.

He pointed out that general legislation was urgently necessary for the following purposes:—1. To empower urban and rural sanitary authorities to inspect, in regard to tuberculosis and any other disease, cows and cowsheds, wherever situated, from which milk was supplied to their districts. 2. To endow county councils with concurrent powers. 3. To amend and to extend the provisions of the Dairies, &c., Order of 1885 so as to make applicable to tuberculosis its regulations concerning the inspection of cattle; to prohibit the use of milk from tuberculous udders as food for animals unless first boiled; and to provide for a sufficiency of moving air at the heads of milch cows kept in cowsheds. 4. To empower the Board of Agriculture to provide free tuberculin for testing the stock of all assenting owners. 5. The application to the kingdom generally of powers on the lines of the tuberculosis clauses of various local Acts, with the further powers of prohibiting the removal of suspected animals and of applying the tuberculin test. 6. The compulsory slaughter of all reacting animals, as it was impossible, except by an almost impracticable system of espionage, to insure their isolation and the disuse of their milk. 7. The payment of full compensation when the slaughtered animal was found to be free from tuberculosis and of substantial partial compensation when the disease was localised, but only in such cases. 8. Penalising the fraudulent use of tuberculin for "fortifying" purposes. 9. Protecting from personal liability sanitary officers acting *bonâ fide*, as per section 265 of the Public Health Act, 1875. Dr. Porter also considered that there should be reference in the model regulations to some cubic space requirements for cowsheds in sparsely populated localities; that periodical veterinary inspection of milch cattle was required; and that information in regard to bovine tuberculosis, and especially in reference to the value of the tuberculin test and the importance of feeding calves on wholesome milk, should be disseminated amongst farmers and cow-keepers.

Sir GEORGE BROWN, in concluding the business of the section, expressed his great satisfaction at the very large and enthusiastic audience which the section had attracted. He hailed with delight the oft-repeated statement that the traders, meat salesmen, and the farmer were all convinced of the great importance of taking every possible precaution for the purpose of getting rid of the disease in the lower animals. He sympathised with the butchers in the injustice to which they had occasionally to submit in regard to the question of seizures. He had called the attention of the Royal Commission to the waste of good meat unnecessarily in this matter owing to seizure by untrained men.

Mr. B. ST. JOHN ACKERS proposed a hearty vote of thanks to the chairman, which was seconded and carried unanimously.

THE PATHOLOGICAL MUSEUM.

The museum of the Congress had been arranged under the auspices of the Museum Committee to give as far as may be a complete ocular demonstration of the disease of tuberculosis. An elaborate catalogue was drawn up and edited by Dr. W. Jobson Horne, the honorary secretary to the committee. It is a well-printed volume of some 200 pages, illustrated with plates, plans, and diagrams. The frontispiece gives a plan of the museum, which was held in the small Queen's Hall. Around the hall were arranged the morbid anatomy exhibits, at the platform end was the microscopic collection, and on the floor of the hall were photographs and drawings, together with an exhibit of bacteriology and experimental tuberculosis. Charts and diagrams hung on the walls.

In the bacteriological section the most interesting exhibits were those of the various bacilli allied to, or simulating, the bacillus tuberculosis. Such was Dr. Moeller's exhibit of the timothy bacillus, the grass bacillus, the butter-and-milk bacillus, and the excrement bacillus. Dr. Lydia Rabinowitch showed a very complete collection of acid-fast bacilli simulating that of tubercle, and Mr. Harold Swithinbank showed a set illustrative of "the hitherto supposed different varieties of the tubercle bacillus, acid-fast bacilli, and organisms of pseudo-tuberculosis and pathogenic streptothrices at different stages of growth." As regards experimental tuberculosis the most striking in view of Professor Koch's speech were the series exhibited by him of preparations illustrating the effects of inoculating cattle with the bacilli of bovine and of human tuberculosis. They certainly show that cattle, including pigs, are resistant to human tuberculosis. On the other hand, there was a series of water-colour drawings illustrating the results of experiments by the late Dr. William Marcet, details of which may be found in his communication to the Royal Medical and Chirurgical Society on May 14th, 1867, in which reference is made to Dr. Villemain's discovery that tuberculosis can be inoculated from man to animals.

The exhibit of the morbid anatomy and pathology of tuberculosis was very complete. The specimens were naturally for the most part taken from British museums, but there was a set of preparations illustrating tubercle of the cardiac valves, of the blood-vessels, and of the thoracic duct exhibited by Professor C. Benda of Berlin. Dr. Haushalter and Dr. Spillmann of Nancy showed 50 photographs illustrative of infantile tuberculosis. Dr. Hugh Walsham and Dr. Ernest W. Martin both showed some excellent skiagrams of the thoracic cavity mainly dealing with tubercle, but in one or two instances with pneumothorax and other non-tuberculous morbid conditions.

The Royal Veterinary College of London and the Royal College of Surgeons of England exhibited preparations showing the effects of tuberculosis in animals, while Dr. George Newman exhibited 23 microscopic slides showing the comparative pathology of tuberculosis in the animal kingdom. The organs producing the specimens came from the Royal Zoological Society.

The remainder of the exhibition was taken up with charts and diagrams, photographs showing the effects of the open-air treatment, and sanatorium fittings. Dr. T. Glover Lyon showed a working model of his ventilating apparatus, Messrs. Maw and Son and the Sentinel Company of Cambridge exhibited sterilisers for milk, while Messrs. R. A. Lister and Co. of Dursley showed their filtering and pasteurising plant. The architectural section, which had been collected and arranged by Mr. Thomas Cutler, F.R.I.B.A., included photographs, plans, and drawings of various sanatoria. Altogether the exhibition was very complete and we think that the Museum Committee may be congratulated on the fruit of their labours.

THE SOCIAL SIDE.

A reception of the members of the Congress was held by the Council of the Sanitary Institute in the Parkes Museum on July 25th. Over 300 members availed themselves of the opportunity of visiting the Museum of Hygiene, including many of the foreign delegates attending the Congress. The visitors were received by Sir Joseph Fayrer, Professor W. H. Corfield, Mr. A. Wynter Blyth (chairman of the council), Dr. H. R. Kenwood (chairman of the Museum Committee), and other members of the council, and full information was given on all points of interest by the secretary of the institute, Mr. E. White Wallis.

The Earl and Countess of Derby received the members of the Congress at an At Home held in the Victoria and Albert Museum, South Kensington, on the night of July 25th. The reception was numerously attended and was characterised by the presence of an unusually large number of the leading lights in the scientific world. The wonderful specimens of the various schools of art were naturally the

subjects of much admiration and the enjoyment of the evening was greatly enhanced by an excellent programme of music played by the band of the Grenadier Guards. In another part of the building Karl Kap's Viennese Band was stationed and it was not until a late hour that the guests departed.

Sir J. Whittaker Ellis and Lady Ellis gave a most enjoyable garden party and river picnic at Buccleuch House, Richmond, on the afternoon of July 26th. The weather was not ideal, but the members of the Congress were able to avail themselves of a commodious electric launch which conveyed parties of the visitors up and down the lovely reach of the river Thames at the foot of the classic Richmond Hill. Lady Ellis had made every arrangement for the comfort of her guests in case of bad weather and the company fully appreciated the hospitality of their hosts.

The Duke and Duchess of Northumberland, in response to an invitation issued by them to the members of the Congress, received a very large company of guests at their mansion at Syon, generally known as Syon House, on the banks of the Thames near Isleworth, on July 27th. The Duke and Duchess had made the most elaborate plans for the convenience of their many guests; carriages were waiting at the various railway stations in the vicinity to convey the visitors to Syon. The Duchess received the members of the Congress at the entrance to the long library overlooking the park and river. The great beauty and elegance of the apartments traversed did not fail to excite the admiration and praise of the foreign visitors. In the grounds commodious tents amply provided accommodation for refreshments, and a military band stationed under a magnificent tree collected a numerous audience. The lovely surroundings of the mansion afforded great pleasure to everycne present, but towards the end of the afternoon the sky became heavily overcast and the more careful of the guests made a speedy departure for London, and they were wise indeed in their generation, for just before 6 P.M. the rain fell in torrents and necessarily occasioned some discomfort.

THE DINNER TO THE FOREIGN DELEGATES.

Lord Derby presided over the banquet given at the Hotel Cecil, London, in honour of the foreign vice-presidents and foreign delegates and also of the delegates representing the Indian Empire and British colonies. The dinner took place on July 26th and was attended by about 300 guests. Among those present were Lord Lister, Lord Reay, the Lord Mayor of London, Sir William Church (President of the Royal College of Physicians of London), Sir Christopher Nixon (President of the Royal College of Physicians of Ireland), Sir Henry Norbury (Director-General of the Medical Department of the Royal Navy), Dr. J. Dunsmure (President of the Royal College of Surgeons of Edinburgh), Dr. J. Andrew (President of the Royal College of Physicians of Edinburgh), Dr. J. Finlayson (President of the Faculty of Physicians and Surgeons of Glasgow), and a very large number of the best known medical and scientific men in the kingdom.

The Chairman proposed the toast of "The King" and acknowledged the great debt which the Congress owed to His Majesty for the interest he had displayed in the campaign against tuberculosis which was due to his initiative. He claimed that the King had been foremost in that movement in this country.

The Chairman, in proposing the toast of "Our Foreign Guests," said: The toast which I now propose is one to which I hope and am sure that all Englishmen will do the greatest honour. When we drink to the health of "Our Foreign Guests" and when we consider who these guests are, surely nothing more is required to stimulate your enthusiasm, and for once to let people see that the Englishman is not so cold a person as he is supposed to be. All those who have come, possibly at inconvenience, and who have brought to this Congress the tribute of their knowledge, the result of their experiments, the help which they can afford by suggestion and by example to the brethren of their profession, to these indeed we worthily pay honour. We are glad to think that this Congress is not that of one, but of many, countries, and that it is a great international movement in which all can join with freedom and at the same time with a sense of comradeship and of relative support which must help on the movement in which we are all engaged. We recognise, as we are bound to do in common candour, that we were somewhat behind in the race at first, that we had to borrow many of our ideas from foreign countries, that we had to copy much which was done, and that we had to try to emulate those undertakings which had been successful elsewhere. In sanatoria, in the arrangements of hospitals, in the separation of patients, and in the separation of those who hardly come within the description of patients we have learnt, as we hope, many lessons. From this Congress we trust that the combination of talent which has been brought together, that the friction of the various wits and intellects which have been brought around our council board, will produce that result to which we look forward and that the conference will not be barren but will leave behind it an abiding good. When I look on the formidable list, formidable in numbers only, of the gentlemen whom I shall have to call upon to reply for their respective countries I feel that I must not take up too much of your time. This, however, you will allow me to say, that while we thank our foreign guests for having come to us we are not satisfied only with that, but we would ask them—and we say it from our hearts as well as from our lips—to remember the cordial invitation we extend to them to come again. We are cold, perhaps, as some say phlegmatic, our "Good-bye" conveys a wish only for the future happiness and welfare of the individual to whom we say it, and we must go to other countries where emotions are better understood or better expressed for the "*au revoir*" or "*auf wiedersehen*" that we all in our hearts desire to utter. We hope that you who have come among us will on some future occasion once more cross the seas and I am sure on behalf of those who succeed me that you will on all other occasions experience the same hearty welcome which we have endeavoured to give you at the present time. I must not sit down without making on behalf of our council my own and their own humble apologies for some of the shortcomings which may have taken place at our Congress. My colleagues one and all have been fairly overpowered with work and if everything has not been as perfectly arranged as clockwork you will in the kindness of your hearts overlook our omissions and recognise that the will was there, however imperfect the performance. Let me thank you, not only for ourselves, but on behalf of our country and on behalf of the world, for the magnificent array of scientific men of distinction who have accepted our efforts and come to help us in our councils. It is with a feeling of pride that I find myself here addressing men whose names are household words in Europe and throughout the world. We shall be able to look back to the time when we spoke to them face to face and in our humility we hope that they when they return home will not entirely have forgotten us. We only wish our foreign guests what in the words of our American cousins we have tried to give them here—that is, "a good time." We wish them all a fortunate journey home and trust that they may gather there further honours and that in time to come we may once more meet in the capital of our country when I am bound to say that we will give them the very heartiest reception that they have ever had. In saying farewell we wish our guests all possible good which may attend the happiness of man.—The toast was responded to by Professor E. G. Janeway (America), Professor L. R. von Schrotter (Austria), Dr. Martin (Belgium), Dr. Mikailovsky (Bulgaria), Professor B. Bang (Denmark), M. Félix Voisin (France), Professor C. Gerhardt (Germany), Professor Pel (Holland), Councillor Raisz (Hungary), Professor Cervello (Italy), Dr. de Lancastre (Portugal), Dr. I. Cantacuzino (Roumania), Señor Don José Verdes Montenegro (Spain), Dr. Klas Linroth (Sweden), Dr. Secretan (Switzerland), and M. Malm (Norway). M. Voisin, whose wonderful elocution allowed of his being understood, though speaking in French, all over the vast hall, intimated that the President of the French Republic authorised him to invite the coöperation of those present in a similar Congress to be held in Paris in 1902 or 1903.

The toast of "Greater Britain" was, in the absence of Sir James Crichton Browne, proposed by Sir Herbert Maxwell, and was replied to by Surgeon-General Harvey (India), Sir David Tennant, and Sir John Cockburn.

"The Health of the Chairman" was given by Sir William S. Church, who said that they were all aware how admirably Lord Derby had presided over the Congress and over that banquet, but they were not all equally aware of the debt that the Congress owed him since he had undertaken the presidency of the organising committee and of the council.—The Chairman, in reply, dealt with the question of the desirability of establishing sanatoria for the poor and concluded with an acknowledgment of the services rendered by Mr. Malcolm Morris and Dr. StClair Thomson.

Correspondence.

"Audi alteram partem."

PROFESSOR KOCH'S ADDRESS AT THE BRITISH CONGRESS ON TUBERCULOSIS.

To the Editors of THE LANCET.

SIRS,—I desire to call attention to an apparent omission in that portion of Professor Koch's address in which he deals with the results of his experimental feeding of swine with bovine tuberculosis. The animals, he says, which "had eaten bacilli of bovine tuberculosis had without exception ..... tuberculous infiltration of the greatly enlarged lymphatic glands of the neck and of the mesenteric glands and also extensive tuberculosis of the lungs and spleen." But although the swine had been infected by the method of feeding no mention is made as to whether tuberculous lesions of the intestine were found in any of the experimental animals. This omission appears to be the more remarkable seeing that in discussing the reasons for his assumption that bovine tuberculosis cannot be conveyed to man by the ingestion of milk or butter containing "living and perfectly virulent bacilli" Professor Koch makes the definite assertion that it is "only when the intestine suffers first" that a case of tuberculosis can be assumed with certainty to have been "caused by alimenta." It may be that although in Professor Koch's address, as reproduced in THE LANCET, no mention of the fact is made, nevertheless, tuberculous lesions of the intestine were really present in addition to those which he enumerates, but in view of the importance which Professor Koch evidently attaches to this condition in the case of man the publication of full details of the post-mortem examinations of these pigs would be of considerable interest.

I am, Sirs, yours faithfully,

July 30th, 1901. S. MONCKTON COPEMAN.

THE SALE OF DRUGS BY MEDICAL GRADUATES.

To the Editors of THE LANCET.

SIRS,—I am instructed to send you the annexed copy of a resolution recently adopted by the Senatus Academicus of this University and to request that you will kindly give it a place in the next issue of THE LANCET.

I may mention that a similar resolution has been adopted by the University of Edinburgh.

I am, Sirs, yours faithfully,

DONALDSON ROSE THOM,

University of Aberdeen, July 29th, 1901. Secretary of Senatus.

(COPY.)

"Whilst it is admitted that the exigencies of practice in certain localities may sometimes render it unavoidable for a medical practitioner to supply to his patients the remedies which he prescribes—the Medical Faculty of this University is of opinion that it is undesirable and detrimental to the position of medical graduates of the University that this custom should be followed under other circumstances; and further, it regards the sale of objects other than remedies by its medical graduates as, under all circumstances, to be strongly deprecated."

THE HIGH ALTITUDE TREATMENT: A CORRECTION.

To the Editors of THE LANCET.

SIRS,—In reference to my paper read at Section II. of the Congress on Tuberculosis (on the Physiological Principles of High Altitude Treatment) the table of comparison of the results of different climates, which you have published in THE LANCET of July 27th, p. 239, is Dr. Theodore Williams's and not mine.—I am, Sirs, yours faithfully,

Dr. O. AMREIN (Arosa, Switzerland).

"THE PROPOSED LEGISLATION ON BAKEHOUSES."

To the Editors of THE LANCET.

SIRS,—The calm and rational tone of the annotation in THE LANCET of July 27th, p. 221, on the proposed legislation on bakehouses contrasts most emphatically and most favourably with the wild and whirling words which appear in the daily press on the subject. This is the first reflection that occurs to one in reading your remarks and the next is some regret that you should even appear to give the weight of your authority and influence to the proposal to abolish all underground bakehouses. A great many of these bakehouses are quite insanitary and their suppression is a consummation devoutly to be wished, but there are other underground bakehouses which are as perfect—from a sanitary point of view—as any above-ground bakehouses can be. And further—and this is perhaps still more important—there are a great many basements which might be occupied as bakehouses and could be made perfect models of sanitation. At present the fatuous clause in Mr. Asquith's Bill prohibiting the opening of any new underground bakehouse stands in the way, so that the occupiers of insanitary bakehouses are practically compelled to go on as they are. You are doubtless aware that some of the finest public buildings in London—such as the Queen's Hall and the Victoria suite at the Hotel Cecil—are underground in the sense that their floor is below the street level. The fact that it would be illegal to convert any of these places into a bakehouse is the *reductio ad absurdum* of the clause over which Mr. Asquith and Mr. John Burns are congratulating themselves.

Your proposal for a committee of experts is one which I advocated some time ago, and is the first step which an enlightened Government would take. Let such committee settle what is necessary for sanitation, and let the results of their working be taken as a basis for legislation; but do not let us impose upon the baking trade a restriction which is neither necessary nor desirable and condemn all underground bakehouses because some are worthy of condemnation.

I am, Sirs, yours faithfully,

EDITOR OF "THE BAKER AND CONFECTIONER."

July 29th, 1901.

ISOLATION HOSPITALS AND SCARLET FEVER.

To the Editors of THE LANCET.

SIRS,—There were so many who wished to speak in the discussion on this subject at Eastbourne on Friday, July 26th, that I held back, feeling sure that someone would take up three points which to me seem to demand consideration. As they were passed by with little or no notice perhaps you will allow me to state them briefly.

1. The more completely isolation is carried out in a given district, of any infectious disease liable to importation, the larger must be each year the number of children not protected by previous attacks and therefore liable to infection. No district has ever managed to isolate more than a part even of the notified cases, and there remain in addition to those known cases left at home all the unrecognised cases as well as the importations from other districts. Outbreaks of measles show what this involves.

2. Isolation, even if partial, is of great value to individual families, not only in enabling them to pursue their occupations with less interruption, but also because it enables them, if not to save their other members from the disease altogether, at any rate to postpone the age at which they take it and so to reduce the risk of mortality.

3. The experience of small-pox (and I probably might say of plague) shows that no serious epidemic of very infectious disease can be controlled by hospital isolation alone. At Middlesbrough, Glasgow, and I think at Gloucester, the spread of the disease was not really checked until general revaccination was introduced. Yet no one seems to question the value of isolation hospitals in small-pox, and I am convinced that in at least two cases, and probably five or six, outbreaks of that disease have been rendered harmless in my own neighbourhood by isolation hospitals. It is the mild and unrecognised cases that will always make complete isolation impossible and incomplete and inefficacious in stamping out small-pox. Why should we expect better results in the case of scarlet fever where as yet we have nothing like vaccination to help us? And is it wise to unsettle public opinion by expressing doubts of the value of isolation hospitals from one point of view without mentioning their advantages in other aspects?

I am, Sirs, yours faithfully,

MICHAEL THOMAS SADLER, M.D. Lond.,
Medical Officer of Health of Barnsley.

Barnsley, July 29th, 1901.

"THE TIMES ARE TROUBLOUS."

To the Editors of THE LANCET.

SIRS,—I can fully bear out your correspondent, "G. P.," in his reference (in his letter in THE LANCET of July 27th, page 229) to the out-patient department as far as my experience goes. Being one of those members of the profession who are devoid of capital I have held an appointment for nearly two years in a hospital and dispensary where the care of the out-patients is entirely in my own charge. The population of the town where this institution is situated is only 12,000, yet we receive an average of over 200 recommendations per month. Many of the patients are in a much better worldly position than myself. I am paid £100 a year or so to treat all comers; the majority are single men with wages of from £1 to 25*s.* per week and married couples with from 25*s.* to £2. A not inconsiderable number have a much higher income, some owning businesses, horses, and fair house property, and in one instance a good farm of 90 acres. I "jibbed" at this a little at first, but was sharply pulled up by my committee. A rigid wage-limit should be fixed, in my opinion, as the practice of giving so much medicine and advice free, not to speak of attendance at home and luxuries provided by "charitable" people, only encourages thriftlessness and a habit of spending all surplus money in the small public-houses that infest every back lane in this and other towns. At the very least the home-visiting system should be kept within very narrow bounds as it is greatly abused.

I am, Sirs, yours faithfully,

July, 1901. SWEATED.

WALES AND WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

The Gelligaer Medical Officer of Health.

THE sanitary district of Gelligaer is really the Merthyr rural district and is contiguous to the town of Merthyr. For many years the late Mr. T. J. Dyke acted as medical officer for Gelligaer and he held the same position in Merthyr. Upon Mr. Dyke's death last year Dr. W. W. Jones, who had been deputy medical officer of health for several years, was appointed medical officer of health for Gelligaer and retained his private practice in Merthyr. When the resolution formally to re-appoint Dr. Jones was before the district council on May 2nd last it was decided by a small majority to insist upon his residing within the area of the Gelligaer district. Dr. Jones having placed before the Local Government Board definite reasons against the proposal, and the district council having stated that they were following the example of the metropolitan boroughs, the Board sent a communication to the council pointing out that the metropolitan medical officers of health are required to devote their whole time to their duties and are paid far larger salaries than the council propose to pay; and, further, that if the Board were to insist upon a medical officer of health living within his district there could be no combined districts under the care of one official. There is no very definite centre in the district of Gelligaer which is made up of colliery villages with populations varying from 2000 to 3000 persons, and as each village has already its own colliery surgeon Dr. Jones would be deprived of his present private practice in Merthyr and the district would, in point of fact, obtain his whole services at the salary of a part-time medical officer of health.

Glamorgan Lunatic Asylum.

In his recently issued annual report the medical superintendent (Dr. H. T. Pringle) states that among the 485 patients who were admitted to the Glamorgan County Asylum at Bridgend during the year 1900 there were 13 who were under 15 years of age and several of these were almost infants. He suggests that a special idiot asylum should be established where these children could be cared for and trained to much greater advantage than when associated with adult lunatics whose language and conduct are not good examples for them. Dr. Pringle also urges upon the asylum committee the desirability of founding a benevolent fund for the assistance of those patients who return to their homes recovered but who, in the case of men, find it difficult for a time to secure employment. The county borough of Cardiff is entitled to 475 of the 1560 beds for which the Bridgend Asylum has accommodation. It is not anticipated that the asylum to be erected at Whitchurch, for which plans are now being prepared for the Cardiff corporation, will be ready for occupation before the end of 1904, and in the meantime patients are being sent from Cardiff to Carmarthen, Hereford, and other places owing to the lack of accommodation at Bridgend.

Delegates to the British Congress on Tuberculosis.

If the interest which is taken in the public health service by the sanitary authorities of Wales is to be measured by the number of delegates who were appointed to the British Congress on Tuberculosis the principality must be in a bad condition. The University of Wales elected four delegates, but there was no representative from a single Welsh county council, not even excepting Glamorgan or Monmouthshire, and among the large towns, Cardiff, Swansea, and Newport alone sent delegates, while of rural districts that of Llandaff and Dinas Powis was the only one represented.

Cardiff Sanatorium.

It has hitherto been the custom for the Cardiff Corporation to treat all patients at the sanatorium free of charge with the exception of those cases sent in by the board of guardians. The Health Committee has now decided to make no charge to the board when the patient sent in by a Poor-law medical officer is merely in receipt of medical relief, but when receiving such relief as to constitute him a pauper a charge of 6*s.* per week will be made to the board.

Dr. Thomas Young.

A portrait of Dr. Thomas Young, from the painting by Sir Thomas Lawrence, has been placed in the Victoria Hall, Milverton, Somerset, with the following inscription: "Thomas Young, M.D., F.R.S., &c., born at Milverton 1773, died 1829, physician, natural philosopher, and master of many languages. He first established the undulatory theory of light, and translated the Rosetta Stone, which is the key to our understanding of the Egyptian hieroglyphics."

July 29th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

University of Aberdeen.

AMONG those who were "capped" at the summer graduation ceremony were 28 candidates who had passed the final examination in the medical faculty.—At the last meeting of the university court gifts of human skulls, &c., to the university museum, from Professor R. W. Reid (Professor of Anatomy in Aberdeen University) and Mr. Ian Rose, medical officer of the Uganda Railway Company, were intimated. Additional examiners for degrees in medicine, &c., were also appointed.—Lord Strathcona is to give his contribution of £25,000 to the University Extension Scheme on condition of the balance required (£20,000) being raised by public subscription. Of this latter sum £2000 has already been promised and the special committee are forthwith to issue an appeal for subscription of the £18,000 still wanted. At the graduation ceremony above mentioned eight medical practitioners were promoted by examination to the degree of M.D. and the honorary degree of LL.D. was conferred on Surgeon-Major Alfred William Alcock, I.M.S., Professor of Zoology in the Medical College of Calcutta, and Professor Rudolph Virchow, Berlin.

July 30th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Belfast Water Board.

AT the present time anything but cordial relations exist between the Belfast Water Commissioners and the Public Health Committee in reference to the origin of the epidemic of typhoid fever. The matter is being a good deal discussed at present from the fact that in a pending vacancy at the Water Board one of the candidates, who is also a medical man (Dr. John Barron), believes that the cause of the frequent—I may say, almost annual—outbreaks of typhoid fever in Belfast is to be found in the polluted subsoil, the result of defective drainage. Dr. Barron says that if he is elected to the Water Board he will retire from the City Corporation.

Sanatoria for the Poor.

Mr. Robert Hall, medical attendant at the Belfast Union Hospital, has recommended the guardians to build a sanatorium in the county for their numerous tuberculous patients, but they have declined on the ground that the poor rates could not be devoted to such a purpose.

Medico-Psychological Association of Great Britain and Ireland.

The sixteenth annual meeting of the above association was held in the Queen's College, Cork, on July 25th and 26th. At the commencement of the proceedings the chair was occupied by Dr. Fletcher Beach, the out-going President, who introduced the President for the coming year, Dr. Oscar T. Woods, medical superintendent of the Eglinton Asylum, Cork. Dr. Woods in the course of his presidential address pointed out that the first public attempt to provide for the treatment of the insane poor in Ireland was made in the year 1722, and he gave an interesting history of the progressive improvements in the treatment of insanity. Between 60 and 70 members attended the meetings and some valuable papers were read. On July 25th the President gave a banquet to the members and several friends at the Imperial Hotel. On the following day Dr. and Mrs. Woods were "At Home" and a large number of guests assembled in the charming grounds of the Eglinton Asylum.

July 30th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Institute of Colonial Medicine.

THE competition which I have already referred to in one of my previous letters[1] between the various towns as to which should have the honour of organising an official course of instruction in colonial medicine still continues. The partisans of this school being created in Paris have collected a sum of money which although considerable is nevertheless insufficient unless Government grants come to their aid—an event which is exceedingly improbable. The Minister concerned with the affair has decided that the instruction shall be given at Bordeaux where the local faculty has already created the organisations necessary and has founded a special diploma in colonial medicine. On the other hand, there is Marseilles to be considered. This city is the port of departure of all the French steamship lines in connexion with the great colonies and receives annually from the colonies on an average 1300 military and naval invalids and 600 civilian invalids. Marseilles offers a magnificent field for study and the clinique has a perfect installation far superior to that which might have been arranged in Paris. Since 1899 the municipal council has created at the School of Medicine five new chairs, one in the bacteriology and pathology of foreign countries, one in colonial hygiene, climatology, and epidemiology, one in colonial natural history, one in tropical clinical medicine, and one in colonial materia medica and bromatology. The professors holding these chairs deliver lectures in colonial medicine to doctors of medicine who reside for three months in the school and who have a special examination which comprises a written paper, for which four hours are allowed, dealing with the pathology of tropical diseases, the hygiene of hot countries, and sanitary police matters. There are also a *viva voce* examination in tropical medicine and practical examinations in microbiology, in the laboratory diagnosis of tropical diseases, in parasitology, and in anthropology and urology as far as they deal with points in tropical pathology. Marseilles also possesses in addition to the School of Colonial Medicine a general colonial department organised at the expense of the Chamber of Commerce under Professor Henkel. This has about 200 students and seven special chairs dealing with the following subjects: vegetable and animal products, parasitic diseases of plants, mineral products, physical geography and geology of the colonies, colonial hygiene and commerce, colonial economics, jurisprudence, and agriculture.

The Chair of Ophthalmology of the Faculty of Medicine.

The faculty has just nominated by election a new professor of ophthalmology to replace M. Panas who has handed in his resignation. The election has given rise to a great deal of discussion. It is always the custom to choose the professors of the faculty of medicine of Paris among those medical men who have been nominated as *agrégés* at a former competition. The only exception to this course is at the creation of a new chair, which is very rare, and even then it is almost always an *agrégé* who is chosen to fill it. In the present case among the *agrégés* of the faculty of Paris there was only one medical man practising as an ophthalmic surgeon, and he could have been chosen as successor to M. Panas, but the professors of the faculty saw that with one candidate there was no opportunity of making a selection, and so they admitted various *agrégés* and professors from the provincial faculties as candidates—amongst others M. Lagrange of Bordeaux and Professor de Lapersonne of Lille. The generality of medical men in Paris and the press were anxious that the faculty should be still more liberal and should allow the candidature of some of the Paris ophthalmologists, several of whom are not *agrégés* of the faculty, a circumstance which is explained by the fact that the chair of ophthalmology which was occupied by M. Panas was a comparatively new creation and that at the age when the Paris ophthalmic surgeons begin their career as specialists they have no particular interest to present themselves for examination as *agrégés*. Throwing open the competition to men of distinction would have been a very popular measure, but the faculty preferred to maintain its ancient traditions and after a severe contest appointed the professor from Lille, passing over the Paris *agrégé* and the Paris medical men who are not *agrégés*.

Prevention of Ophthalmia Neonatorum.

Whilst certain legislative measures relative to public health were being discussed in the Senate a senator who was also a medical man proposed the introduction of a clause making it compulsory for midwives and accoucheurs to bathe a new-born child's eyes at once with solution of permanganate of potassium in order to prevent ophthalmia. The Minister of the Interior consequently requested the Academy of Medicine to supply him with an outline of the instructions which ought to be given to midwives in this respect. M. Pinard, to whom the question was referred, was of opinion that permanganate of potassium ought not to be ordered specially and exclusively, as it is by no means the only substance efficacious in the treatment of ophthalmia. The recommendations of M. Pinard were as follows: (1) the distribution in all *mairies* of short descriptions of the causes, symptoms, and dangers of ophthalmia in new-born infants; (2) immediate notification of purulent ophthalmia everywhere and in all cases; and (3) the appointment in connexion with lying-in establishments (clinics and maternities) of ophthalmologists to superintend the treatment of purulent ophthalmia and to give the requisite instructions to the pupils, medical men, and midwives.

July 29th.

[1] THE LANCET, June 15th, 1901, p. 1716.

THE SERVICES.

ROYAL ARMY MEDICAL CORPS.

SURGEON-CAPTAIN A. MACDONALD, Army Medical Reserve, assumes temporary medical charge of the troops, Station Hospital, Edinburgh Castle. Captain C. Dalton, at Hounslow, is ordered to West Africa for service. Surgeon-Major Crooke-Lawless joins at Aldershot for duty. Lieutenant J. B. Clarke has joined at Aldershot, and has been posted to the Depôt for a course of instruction. Lieutenant-Colonel M. D. O'Connell is appointed principal medical officer, North-Eastern District, vice Colonel W. E. Saunders, posted to India.

IMPERIAL YEOMANRY.

18th Battalion: The under-mentioned officer relinquishes his commission, dated July 16th, 1901: Temporary Captain H. W. Whyte, Medical Officer.

SOUTH AFRICAN WAR NOTES.

Civil Surgeons Tucker, John Burton Rudduck, and Davies have been discharged from hospital for duty. Civil Surgeon C. R. Hodgson is on passage home.

VOLUNTEER CORPS.

Artillery: 1st City of London (Eastern Division, Royal

Garrison Artillery): George Johnston to be Surgeon-Lieutenant. Dated July 27th, 1901. *Rifle:* 2nd (Prince of Wales's) Volunteer Battalion the Devonshire Regiment: Surgeon-Lieutenant A. R. Rendle to be Surgeon-Captain. Dated July 27th, 1901. 1st Volunteer Battalion Princess Charlotte of Wales's (Royal Berkshire Regiment): Surgeon-Lieutenant W. G. Heasman to be Surgeon-Captain. Dated July 27th, 1901.

His Majesty the King held an Investiture at St. James's Palace on July 25th and conferred the Distinguished Service Order upon the following officers:—Surgeon-Captain W. Fletcher and Staff Surgeon E. C. Lomas, R.N.

Major R. P. Bond, R.A.M.C., was amongst the recipients of war medals presented by the King at Marlborough House on July 29th.

Surgeon-Major-General W. A. Thomson, A.M.S. (retired), Honorary Physician to the King, has been selected for a Good Service Pension of £100 a year.

Obituary.

CARSTEN HOLTHOUSE, F.R.C.S. ENG., L.S.A.

MR. CARSTEN HOLTHOUSE had truly reached a ripe old age when almost at the end of his ninety-first year he closed his earthly career on July 18th. He was little known to the present generation of the profession, but 30 years ago, as senior surgeon to the Westminster Hospital and lecturer on surgery in its school and as a frequent attendant at the medical societies, he was a familiar figure. There are many who will remember the short, spare, well-set man, brisk in his movements, somewhat brusque and dogmatic in the enunciation of his own views, yet always kindly and conscientious in his criticism of the opinions of others, and keen and enthusiastic in the interest he ever took in surgical practice and in the progress of surgical knowledge. His enthusiasm and absence of self-seeking were notable and could not fail to gain for him the respect and esteem of his contemporaries.

Mr. Holthouse was born on Oct. 14th, 1810, at Edmonton, being the eldest son of Mr. Carsten Holthouse of that place. After an education at private schools he, in his fifteenth year, became the articled pupil, as was then the custom, of his uncle, Mr. Le Gay Brewerton of Bawtry, in Yorkshire. Later he entered at St. Bartholomew's Hospital and was a dresser under the late Sir William Lawrence. As was usual at that time he sought the double qualification and became a Licentiate of the Society of Apothecaries in 1832 and a Member of the Royal College of Surgeons of England in 1833. After a visit of some six months to the Paris hospitals he commenced practice in his father's house in Keppel-street and industriously attended the out-patient department of St. Bartholomew's Hospital. We next hear of him as being appointed lecturer on anatomy and physiology at the Aldersgate-street School of Medicine in succession to, and at the instigation of, Mr. Skey. It was whilst holding this appointment that Mr. Holthouse became known as a teacher and made a reputation which led to his election as one of the original Fellows of the College in 1843. At the time of his death he was the senior of the very few surviving original Fellows.

In 1849 Mr. Holthouse was the successful candidate for the Lectureship of Anatomy of the resuscitated Medical School of Westminster Hospital. His valuable services on taking up this appointment were very inadequately appreciated at the time. Dr. Hunter, his predecessor in the chair, had a few years before carried away with him the greater part of the anatomical preparations, probably his own private property, and a month after Mr. Holthouse had begun his first course of lectures the College of Surgeons condemned the deficient remains of the anatomical museum as insufficient for the proper teaching of the subject, and the school would have been closed had not Mr. Lane of the Grosvenor-place School offered to take over the anatomical pupils. Mr. Holthouse at the same time undertook, if £30 were granted to him for the purpose, to provide before the end of the year all the anatomical preparations required by the College. He was at once appointed curator of the museum, the amount was voted, and before the end of December, by making good every one of the deficiencies, he satisfied the requirements of the College authorities and obtained permission for the students to resume their attendance at his anatomical lectures. The school, however, did not prosper, and after lecturing for five years without remuneration Mr. Holthouse was so dissatisfied with the condition and management of the school that he sent in his resignation of the chair of Anatomy. This brought matters to a head, and Mr. Holthouse was induced to continue to hold his chair by being unanimously appointed sole manager of the school with a free hand to make the necessary improvements. In this way Mr. Holthouse saved the school from destruction and was the energetic means of establishing it on a more satisfactory basis. Mr. Holthouse was appointed assistant surgeon to the Westminster Hospital in April, 1853. In the following year, a base hospital for the sick and wounded from the Crimean war having been established at Smyrna, he went out as one of its surgeons in company with Hulke and Streatfeild and others. On his return to London he took a house at Storey's-gate and resumed his work at Westminster. At the same time he took up the study of ophthalmic surgery and soon after assisted in the founding of the South London Ophthalmic Hospital, an institution which has recently been rebuilt and has discarded all local association from its name. In 1857 he was promoted to the full surgeoncy of Westminster Hospital, a post which he held until 1875, when by the rules of the hospital he retired to the office of consulting surgeon. For some years, too, he held the chair of Surgery in the school, a post from which he retired in 1873.

Mr. Holthouse's published writings show best the versatility of his mind. In 1838 he wrote three papers on the "Acarus Scabiei" which attracted some attention. In 1854 he published "Six Lectures on the Pathology of Strabismus and its Treatment by Operation." Four years later appeared a book on "Squinting, Paralytic Affections of the Eye, and Certain Forms of Impaired Vision." In the same year, in 1858, he published "Practical Observations on the Radical Cure of Inguinal Hernia." In 1870 he gave to the profession his more mature views on this subject in a larger volume "On Hernial and other Tumours of the Groin and its Neighbourhood, with Practical Remarks on the Radical Cure of Ruptures." The article on the lower extremities in the second volume of Holmes's "System of Surgery," which appeared in 1870, was from his pen. A year later he published a *brochure* "On the Proper Selection and Scientific Application of Trusses." After his retirement he took great interest in the question of the treatment of inebriates and wrote letters and articles on the subject which conduced much to a more healthy public opinion on the subject.

Mr. Holthouse possessed a sound practical knowledge of surgery and was in many ways a good teacher. If he failed to make his mark as a successful competitor for the confidence of the public it was probably the natural result of the versatility of his mind on the one hand and of a certain want of concentration on the other. As has been well said, success would seem to be almost impossible without a power of concentration and a habit of attention to minute details, and it was doubtless owing to defects of this kind that Mr. Holthouse failed to secure the public appreciation which his talents deserved. Mr. Holthouse was twice married—in 1853 to Agnes, the daughter of Mr. Samuel Kent of Clifton, and in 1869 to Martha, daughter of Dr. John Inglis Nicol of Inverness. Of his children by his first wife three sons survive him.

THOMAS LIVINGSTONE, M.D., M.S. GLASG.

DR. LIVINGSTONE passed away at London on July 16th at the age of 52 years, on his return from Germany where he had been staying for the benefit of his health. For the last two years he had been suffering from angina pectoris and on the recommendation of his medical advisers he went seven weeks ago to Bad-Nauheim for the Schott treatment. His health, however, did not benefit from the visit and it was on his way home to Stanhope, Co. Durham, that he suddenly expired at a London hotel. The deceased gentleman had acquired a large practice at Stanhope. Not only did he gain distinction by his medical and surgical skill, but by his kindness and geniality he became not only the medical adviser but the friend and counsellor of all classes, but more especially of the poor

and needy. He also interested himself in local affairs and at various periods of his life held all the important local public offices. He became a member of the Stanhope School Board at its formation, and for the last 23 years, until his untimely death, was its chairman. He also took an active part in Poor-law affairs, and he became a member of the board of guardians, being chairman from April, 1885, to February, 1894, when he resigned. For some years he was medical officer of health of one of the Stanhope rural districts. In educational matters he took a very deep interest. The best instruction that was obtainable he wished to place at the disposal of the people, and it was chiefly due to his efforts that the School Board, finding that small wages were unproductive of good results, decided to remunerate their teachers more liberally. On the establishment of the county councils Dr. Livingstone was elected a member of the Durham county authority. His services in connexion therewith were highly valued and he was elected an alderman eight years ago, which position he held at the time of his death. He was also chairman of the Health Committee of the county council and had occupied that position for the last 10 years with great ability. He took a very lively interest in the St. John Ambulance Association and in the volunteer forces he occupied the position of surgeon for many years. He was also a magistrate for the county of Durham, being appointed some 10 years ago. As evidence of the esteem in which the late Dr. Livingstone was held by his friends and neighbours of Stanhope and the dales two years ago he received a handsome presentation, the outcome of public subscription, on the occasion of his silver wedding. His funeral, which took place on July 18th, was largely attended, genuine sorrow being evinced by all classes. He leaves a widow (a sister of Mr. Joseph Walton, M.P.) and two sons to mourn their loss.

CHARLES DAGNALL CLARK, M.B. LOND., M.R.C.S. ENG., L.R.C.P. LOND.

THE death is announced, at the early age of 45 years, at Sydney, N.S.W., of Dr. C. D. Clark, eldest son of the late Mr. Alfred Clark, Cross Deep, Twickenham. He was educated at Uppingham, and on leaving that school decided on entering the medical profession. He matriculated at the University of London, first in honours with scholarship. As a student of St. Bartholomew's Hospital, London, he obtained the Kirkes gold medal and was appointed resident gynæcologist under Dr. Matthews Duncan. His health failing he left for Australia, where he shortly afterwards obtained the appointment of resident surgeon at the Prince Alfred Hospital, Sydney. After three years' service he entered upon private practice and was appointed on the staff of the hospital. His death will be mourned by a large circle of patients and friends. He leaves a widow and four children.

"SALTPETRE."—At the Devizes Borough Petty Sessions held on July 18th, a firm of provision merchants were summoned at the instance of the Wilts County Council for selling as saltpetre an article which was not of the quality and substance demanded. The county analyst stated that the percentage composition of the sample sent to him as saltpetre consisted of sodium nitrate, 97·2 per cent.; potassium nitrate, 1·8 per cent.; chlorides and sulphates, 0·7 per cent.; and water and insoluble matter, 0·3 per cent. For the defence it was stated that hundreds of tons of this substance were sold for bacon-curing purposes. The magistrate inflicted a fine of 10*s.* in addition to 8*s.* 6*d.* costs.

CARMARTHEN JOINT COUNTIES LUNATIC ASYLUM.—The thirty-sixth annual report of this asylum, which accommodates the lunatics of the three counties of Carmarthen, Cardigan, and Pembroke, has just been issued. During the year 116 cases (67 males and 49 females) were admitted. The discharges amounted to 57. The deaths numbered 76, a larger number than usual owing to an outbreak of influenza. On Dec. 31st, 1900, there remained under treatment 633 patients (329 males and 304 females). The charge made for maintenance of pauper lunatics was 7*s.* 7*d.* per patient weekly.—Miss Alice Neville Johnson, M.D. Brux., L.R.C.P. Edin., L.S.A., was appointed on July 25th second assistant medical officer to the asylum at a salary of £130 per annum.

THE BRITISH MEDICAL ASSOCIATION.

MEETING AT CHELTENHAM.

THE sixty-ninth annual meeting of the British Medical Association commenced its session in Cheltenham on Tuesday, July 30th. This is the second time that the Association has visited Cheltenham, the first being in 1837, the year of the accession of Her Majesty Queen Victoria, and it is somewhat curious that the year of the present visit is marked by the accession of His Majesty King Edward VII.

Dr. G. B. Ferguson, President of the British Medical Association, delivered an exceedingly interesting Presidential Address at the first (adjourned) general meeting. His description of the position now occupied by scientific medicine was not only eloquent but learned. As a rule a *résumé* of medical progress is rather a dreary thing to listen to, the orators who are condemned by circumstances to speak to this theme being apt to use the same words in describing the same things. Dr. Ferguson's address was not in the least stereotyped in character. Obviously familiar with the many-sided developments that have followed upon recent research, he touched suggestively upon the more important, and in so doing justified his forcible plea for better facilities in this country for the pursuit of science. "A Faraday, a Koch, a Pasteur would be a cheap purchase at a million" is his forcible answer to those who would oppose the educational demands of progressive science by a counter-cry of economy.

Cheltenham is of course renowned for its waters, its good shops, its tree-bordered streets, and its educational advantages for either sex.

The town has evidently decided to "do the thing well," and even the shops show the influence of medicine. Thus the principal printshop has filled its windows with medical pictures. There is a photograph of Rembrandt's celebrated "Lesson in Anatomy," and engravings of Luke Fildes's "The Doctor," and William Small's "The Good Samaritan." This last-named picture, which attracted some notice in the Academy last year, illustrates an episode in the day of a country practitioner with great fidelity. The child of a gipsy has been taken ill and the dogcart of the medical man has been stopped as he passes the encampment. There are also in this shop four studies of apparently quite healthy young women stripped to the waist and entitled "L'Odalisque," "Epanouissement," "Jeunesse," and "Reverie," chosen, we suppose, to exhibit different types of chest.

The opening service was held at St. Matthew's Church on Tuesday, July 30th, at 11.30 A.M., when the large congregation completely filled the building. The preacher was the Very Rev. the Dean of Gloucester (Dr. Spence), who based his remarks upon the text, "Luke, the Physician," and, in concluding, paid a warm tribute to the work done by the medical profession which, in his opinion, most nearly approached to the ideal of the Master Himself. The musical portion of the service was of a very mediocre description and slovenly in parts—probably due to an augmented choir which had not practised together. The collection, as usual, was on behalf of the Royal Medical Benevolent College and the British Medical Benevolent Fund.

The Organising Committee of Reception and certain of the municipal authorities, with whom was the mayor,

gave their first welcome and "at home" to the members and their friends in the Winter Garden of the "Garden Town," on Monday evening, July 29th, thereby pleasantly anticipating the opening of the meeting. The Winter Garden, which is a large glass structure of pleasing ornamental design, was gaily decorated and the illuminated fountains in the centre served to relieve the closeness of the atmosphere. The lawns were illuminated with myriads of fairy lights. The guests were well pleased with their reception and with the excellent entertainment provided, which exceeded in display and magnitude any similar event of previous occasions.

The fact is, Cheltenham is admirably adapted for both the festive and the serious side of a gathering of this sort. There are excellent buildings wherein to hold the meetings and open spaces for garden parties. Above all, the various places of meeting and of entertainment are not scattered, but within an easy distance of the reception room and Winter Garden.

Not the last to appreciate the excellent accommodation which Cheltenham affords were the exhibitors in the Annual Museum. No better place could have been selected than the Winter Garden and the exhibitors themselves did not miss their chance of making their exhibits attractive. It need hardly be added that the fact that the first reception was held in the Winter Garden and on its lawns was very much appreciated by the exhibitors. Everyone's attention was thus necessarily drawn to the exhibits and the building was crowded even up to the time of closing—11 P.M. The genial weather added considerably to the pleasure of the occasion. We deal at length elsewhere with the great number of exhibits comprising drugs, foods, and medical and surgical appliances that were presented to view. An important feature of the exhibition this year was the display of ambulance wagons, motor-cars, &c., in a marquee on the grass adjoining the Winter Garden.

The general impression is that no previous exhibition has had such opportunities for securing success. The Pathological Museum (opened only to medical men) adjoined the Winter Garden. We congratulate the local organising secretaries on the very excellent way in which they have provided for, and dealt with, this important section of the meeting. They must certainly feel it a reward to hear on all sides expressions of pleasure and satisfaction with the arrangements.

Cheltenham is evidently keenly alive to the public health requirements as well as to general public administration. The water-supply is good and is derived from the huge watershed of the Cotswolds. But a reservoir situated a few miles up the Oxford and London road seems to us open to criticism. It is close to the road and apparently no provision is made to prevent road-dirt from getting into the water. The reservoir is not banked up, nor is it protected by a cordon of trees as is the case in most other places. The water is filtered. Cheltenham possesses a refuse destructor and a public abattoir. The sewage is discharged upon the land, though we should think that Cheltenham was favourably environed for a system of purification and disposal by bacterial methods. The public health is good, the vital statistics being very favourable. The electric light and the principal baths are in the administration of the corporation.

The waters of Cheltenham have, of course, been known from very early times, and it seems to us that they present a very interesting composition which deserves more attention than has hitherto been allotted to them. At the Montpellier Spa there are two distinct waters—one a magnesia saline water and the other an alkaline saline water. They may be regarded as mild Carlsbad waters, and there is no reason why they should not be just as therapeutically efficient, having regard to the amount of saline ingredients contained in them. At the Cambray Spa there are two waters—one a chalybeate and the other a saline. The chalybeate contains as much as seven grains of carbonate of iron per gallon, which are associated, it is interesting from a therapeutic point of view to add, with 24 grains of the purgative salt, sodium sulphate, and with sodium chloride. This spa is not under the management of the corporation.

In the prettily wooded and watered Pittville Park, to the north-east of the town, is situated the Pittville Spa and Pump-room. The water here belongs to the class of alkaline saline waters. The sulphated waters are concentrated by evaporation for convenience of dosage. The Pittville Spa contains a spacious room for the amusement and recreation of people drinking the waters. All three sources of water are practically in a straight line from the south-west to the north-east of the town and nearly parallel with the tree-bordered promenade, the Montpellier Spa coming first, then the Cambray Chalybeate, and lastly the Pittville Spa.

The seventieth annual meeting of the Association will be held in Manchester next year, under the presidency of Mr. Walter Whitehead, F.R.C.S. Edin.

THE GENERAL MEETINGS.

THE FIRST GENERAL MEETING.

The first general meeting of the Association was held in the Princess Hall of the Ladies' College at 2.30 P.M. on Tuesday, July 30th. Both the members of the Council and the ordinary members of the Association were present in large numbers.

The minutes of the last annual meeting were, on the motion of Dr. W. A. ELLISTON, the retiring President, confirmed and adopted, after which Dr. Elliston vacated the chair in favour of his successor, Dr. G. B. Ferguson, senior surgeon to the Cheltenham Hospital.

Dr. FERGUSON, after thanking the Association for electing him, gave notice that he would move that a humble and loyal address should be presented to His Majesty King Edward VII., Patron of the British Medical Association. Having read the address it was duly seconded by Dr. JOHN ROBERTS THOMSON and carried unanimously.

The usual vote of thanks to the retiring President was then moved by Dr. M. BEVERLEY and seconded by Mr. VICTOR HORSLEY. This was unanimously carried and acknowledged in a few suitable words by Dr. ELLISTON.

The PRESIDENT (Dr. Ferguson) then reported the following recommendation:—

That the thanks of the Association be given to the Right Honourable Walter Hume Long, P.C., M.P., for his strenuous efforts to stamp out hydrophobia whilst President of the Board of Agriculture.

This was seconded by Mr. C. H. W. PARKINSON and carried unanimously.

The next business on the programme was the report of the Council and the financial statement, which was moved by Dr. ROBERTS THOMSON. He paid a tribute of sympathy to Mr. Fowke, the general secretary, in a few well-chosen words and also referred to the circumstances surrounding the family of the late Mr. R. B. Anderson.

Dr. JOHN HADDON (Hawick) made his usual protest against the scientific grants, while Dr. BRASSEY BRIERLEY wanted to know about editorial expenses and the cost of printing.

Mr. ANDREW CLARK, the treasurer, set Dr. Brassey Brierley's mind at rest about the cost of printing, after which Mr. COLIN CAMPBELL spoke as to the desirability of articles in the *British Medical Journal* being signed.

Dr. DAWSON WILLIAMS, the Editor of the *British Medical Journal*, then gave a few details as to how payment for articles in the journal was managed.

Dr. HADDON, who had in his previous speech suggested that a scientific grant should only be allotted to research in

some set subject, now handed in the following motion, which was seconded by Mr. NELSON HARDY :—

That it be a suggestion to the Scientific Grants Committee to offer the money they spend for a prize or prizes on some subject on which we require original research, such as metabolism.

After some remarks from Mr. BUTLIN, Dr. EDRIDGE-GREEN, and Surgeon-Colonel INCE, who was understood to move the previous question, Dr. Haddon was asked to withdraw his motion, but he refused.

It was accordingly put to the meeting and was lost.

The motion as to the report proposed by Dr. ROBERTS THOMSON and seconded by Mr. ANDREW CLARK was then put and carried.

It was in the following terms :—

That the report of Council, together with the financial statement for the year ending Dec. 31st, 1900, be received and adopted.

That Messrs. Price, Waterhouse, and Co. be, and they are hereby, appointed auditors of the British Medical Association until the next annual general meeting at a remuneration of £105.

The reports of the various committees were then received, but over the report of the Indian Military Medical Services Sub-committee a long discussion arose.

The report was as follows :—

REPORT OF THE INDIAN MILITARY MEDICAL SERVICES SUB-COMMITTEE.

This Committee has met twice to consider the subject referred to it from the annual meeting held at Ipswich. The Committee has received a letter from Surgeon-General Harvey repudiating the charges put forth by Dr. Mullick against the I.M.S. The Committee has requested Dr. Mullick to furnish it with a summary of his evidence in support of his statements, but he has failed to communicate with the Committee in any way. The Committee deprecates the attitude of Dr. Mullick in preferring charges against the administration of an important public service which he has failed to substantiate.

JAMES BARR, M.D., Chairman.

Dr. SARAT K. MULLICK moved that the report be referred back. He had been granted a term of three months from April 30th within which to procure evidence. That term had not yet run out and moreover he had supplied the Committee with evidence by July 15th. Moreover, Dr. Barr had published in the *British Medical Journal* evidence which Dr. Mullick had supplied to the Committee and which was confidential.

Mr. GEORGE BROWN seconded.

Surgeon-General HARVEY reiterated his statements repudiating Dr. Mullick's charges, after which Mr. JOSIAH OLDFIELD, speaking as a barrister, exhorted the meeting to refer the report back because of the time-limit not having expired when the report was drawn up and because Dr. Barr had published evidence.

Dr. JAMES BARR, who was imperfectly heard in the body of the hall, was understood to point out that Dr. Mullick had produced no fresh evidence, but only that which had been already put in by the late Dr. Bahadurji.

Eventually a motion to refer the report back and another to leave out a portion of the report were negatived and the report was received.

The discussion of the Constitution Committee's report was deferred and the meeting adjourned.

THE (ADJOURNED) FIRST GENERAL MEETING.

The adjourned meeting was held on Tuesday evening in the Princess Hall of the Ladies' College, for the delivery of Dr. G. B. Ferguson's presidential address. The attendance was good and among those present were His Worship the Mayor and many prominent citizens.

Mr. Alderman G. NORMAN presided.

The Local Secretary (Mr. G. A. CARDEW) read out the names of the foreign and colonial delegates, each of whom went on the platform and was welcomed by the President. Their names are as follows :—Dr. Durier, Dr. J. Rivière, Dr. Dubreuith, Dr. Sabouraud, and Dr. Noiré, of Paris ; Dr. Ernest Otto, of Teneriffe ; Dr. F. W. McRae, Dr. A. H. Ferguson, Dr. A. R. Reynolds, Dr. Punton, Dr. Allan Fisher, Dr. Lewis Schooler, Dr. B. T. Whitmore, Dr. J. C. Shruder, Dr. G. Dock, Dr. H. M. King, Dr. Emerson M. Sutton, and Dr. Judson Dorland, of the United States of America ; Dr. Boxhill, Dr. Gooding, and Dr. Wolseley, of the Barbadoes Branch ; Mr. Eldon Harvey, of the Bermuda Branch ; Dr. A. J. Turner, of the Brisbane and Queensland Branch ; Dr. W. H. De Silva, of the Colombo and Ceylon Branch ; Dr. G. P. Jordan, of the Hong-Kong Branch ; Dr. W. Young, of the New Zealand Branch ; Dr. W. Chisholm, Dr. W. H. Coutie, and Dr. E. M. Pain, of the Sydney and New South Wales Branch.

The MAYOR then addressed the meeting, commencing by saying that Dr. Ferguson needed no introduction. He then, in the name of the town, bade the Association welcome and called upon Dr. Ferguson to give his address.

The PRESIDENT, wearing the scarlet and crimson gown of his degree, then delivered his presidential address, which was as follows.

THE PRESIDENT'S ADDRESS.

[Dr. Ferguson took as the title of his address, "Scientific Research : the Indispensable Basis of all Medical and Material Progress," and commenced by bidding the Association welcome to Cheltenham. He referred to the fact that the Association had not visited Cheltenham since 1837, the year of the accession of their late lamented Queen, and that the year of their present visit was also the year of the accession of a British Sovereign, His Most Gracious Majesty Edward VII. He then passed on to give a short account of Cheltenham and its waters and mentioned several of the past medical worthies of the place. Such were Dr. Baron, Dr. Wyldbore Rumsey, Mr. Clement Hawkins, Mr. Charles Fowler, and Dr. Evans of Gloucester. He continued by reminding his hearers that the tripod of medicine was anatomy, physiology, and pathology. He then gave a *résumé* of the condition of medicine in Britain and other countries 100 years ago and in reference to Jenner spoke as follows :]

Dr. Edward Jenner.

A hundred years ago Edward Jenner was practising in Cheltenham, and here the *genius loci* reminds me that I must not dismiss our greatest medical celebrity with a single line. To me the most interesting point about Jenner is that he was educated by John Hunter, which is to say that he became and remained a naturalist. He was not, however, neglectful of medicine—indeed, he manufactured an improved tartar emetic—but he was at first more interested in fossils, hedgehogs, and cuckoos. His celebrated paper on the cuckoo, describing for the first time the inconsiderate conduct of the young cuckoo to his fellow-nestlings, need not be referred to here further than to state that for a long while he reckoned a personal visit to all the young cuckoos in his neighbourhood as the first of his or his nephew's duties in May and June. It was this kind of training in natural observation which led at last to such productive fruit as his celebrated Inquiry into the Causes and Effects of the Variolæ Vaccinæ, which was published in 1798. Wishing to test a tradition at Berkeley, where he was born and practised at first, as to the small-pox immunity conferred by cow and swine-pox, and fulfilling Hunter's injunction, "Don't think, but try," he made his first experimental inoculation from swine-pox on his eldest son, aged one and a half years, in November, 1789. It was nearly eight years afterwards before the next step was made, for it was on May 14th, 1796 (two years before the publication of his book), that lymph was taken from the hand of Sarah Nelmes of Berkeley, who had been infected by her master's cows and was inoculated into the arms of James Phipps, a healthy boy, eight years of age. A typical vesicle and areola were produced and two subsequent attempts to inoculate James Phipps with small-pox proved perfectly futile. Jenner next sent lymph to London to Mr. Cline whose patient also resisted all attempts to inoculate him with small-pox. Jenner was thereupon invited to London and wrote from Cheltenham in reply on Sept. 29th, 1798, his often-quoted letter in which he expresses his preference for the "lowly and sequestered paths of life, the valley and not the mountain," declaring his contentment and contempt of fame and fortune, "fame being only a gilded butt, for ever pierced by the arrows of malignancy." He took up his regular abode in Cheltenham in July, 1800, living at first in the High-street and aftewards at 8, St. George's-place. Though often absent he spent much of his time here for many years, as letters of his dating from 1802 to 1813 testify, vaccinating gratuitously at Alpha House, Bayshill, the residence of the present Mayor of Cheltenham, all the poor who made application to him. You know the rest, the rapid extension of the practice the world over, the parliamentary grants to him of £30,000, his medals and diplomas and honours from every nation, and the tardy and unwilling acceptance of his teaching by his own countrymen. Later came detraction, obloquy, and neglect, followed at last by 443 deaths from small-pox in 1896 in his own county, in the neighbouring city of Gloucester ; and, finally, the perilous experiment of leaving the decision as to whether vaccination should be done or not to the discretion or indiscretion of each head of a family. I am bound, however, to

state that the perilous experiment is turning out much better than could have been expected. Truly you will mourn with me over those 443 preventable deaths in Gloucester, one of them of a vaccinated child and 297 of them of unvaccinated children under 10 years of age, when you reflect that during the same year and the next one there were, in well-vaccinated and revaccinated Germany, only 15 deaths from small-pox throughout a population of 53,000,000. Does anyone want more proofs? If so, they have them in the records of our own profession, which suffers from a general zymotic mortality far beyond, but from a small-pox mortality far below, the average; and this though we of necessity are much more than the general public exposed to the infection of small-pox. We, ladies and gentlemen, know the truth and how to act up to it, and most earnestly do I wish success to Dr. F. T. Bond and to the Jenner Society in their truly philanthropic enterprise of combating error and disseminating truth. I will say no more of Jenner and his work, though in this town, the former centre of his activity, I could not well say less; I must, however, add that the sad experience of Gloucester has not been fruitless and that Jenner's county is now perhaps the best protected against small-pox of any in England.

Dr. Ferguson next proceeded to consider

The Medical Standpoint of To-day the Result of Scientific Research.

He said: Pondering over medicine as it stands to-day, the main fact that strikes me about it is how much more it owes to the biologists and to the men of pure science than to the so-called practical men. The practical man is indispensable, but he is not like the great biologists, a high priest of the arcana of nature. The cell theory, for example, lies at the very foundation of modern medicine, and this theory certainly originated entirely with the biologists. The term "cell" was first used in reference to plants in the seventeenth century (1665) by Hooke who, with his contemporaries Grew and Malpighi, distinctly foreshadowed the cell theory of modern times. The cell nucleus was actually seen and drawn by F. Bauer so long ago as 1802, though it was not before 1831 that it received that name from Robert Brown, the botanist. Little notice, however, was taken of the subject before the publication of Schleiden's paper on Phytogenesis in Müller's *Archiv* for 1838, in which he asserted that "every plant is an aggregate of individualised, independent, separate beings—namely, cells." Theodor Schwann, also in the next year, made a similar assertion regarding animals in his "Microscopical Researches," of which, and of Schleiden's paper also, the Sydenham Society published a translation in 1847. Schwann was first impelled to his conclusion by noticing the extraordinary resemblance between the microscopic structure of the chorda dorsalis of the tadpole and that of the onion and of certain pollen matrices. Schwann, however, fell into error in asserting that cells arose spontaneously, and here he was set right by Barry in 1838 and later by Goodsir, who established the direct descent of every cell from a pre-existing one. This is Virchow's "continuity of life," his "*Omnis cellula e cellulâ*," the aphorism which he offers us in the place of Harvey's "*Omne vivum ex ovo*." That *punctum saliens*, the nucleolus, was first noticed by Schleiden, though it was Schwann who gave it that name. Next came Hugo von Mohl in 1846 who recognised what we now call protoplasm in the cells of plants, the identity of which with a similar substance in the cells of animals was soon afterwards proved by Cohn and Remak. To Schwann a cell without a wall and a nucleus was no true cell, but Leydig in 1856 adduced pus and mucus corpuscles as instances of wall-less cells, and so step by step the ground was cleared for the now historical cellular pathology of Virchow, which influenced so profoundly the medical thought and practice of 43 years ago. To Virchow, as to Schwann, a cell wall was a necessity, though this idea was soon afterwards dispelled by Lionel Beale and independently by Max Schultze in 1861. To Max Schultze we owe not only the extension of the term "protoplasm" (the bioplasm or living matter of Beale) to the contents of animal cells also, but the best description of an animal cell—namely, that it is a protoplasmic mass containing a nucleus. This work on the cell theory gave the original inspiration to Pasteur, and Pasteur leads up to Lister, of whom I will forbear to speak, for he needs no speech, though he might well say of himself, "*Quæ regio in terris nostri non plena laboris?*" I may mention this significant fact, however, that visiting the Polyklinik in Vienna two years ago I noticed that the only name of a contemporary Briton inscribed on its façade was that of Lister. The cell theory, further, leads up to bacteriology, the most imposing and the most impressive department of medical biology. Now bacteriology, which originated with the labours of Cohn and De Bary, rests on cultivation and staining; and if year by year more and more of the germs of disease are recognised it is because improved methods are constantly being perfected for colouring and making visible these formerly invisible entities. The modern practice of staining, so essential to the physician and surgeon of the day, began with the botanists Göppert and Cohn who used carmine in 1849, and here again the pure scientists showed the way to the practical investigators of medicine, such as Gerlach of Erlangen, who first applied the method to anatomy. In 1871 and later Weigert succeeded in demonstrating nuclei by ammoniated carmine and cocci by methyl violet. In 1872 Eberth and Wagner began the use of that admirable stain, hæmatoxylin. Looking through some old preparations of mine not long ago I found that most of those stained with aniline dyes were faded, but those stained with hæmatoxylin were still bright and good. In 1879 Ehrlich enunciated his remarkable generalisation that the basic coal tar colours (like fuschin, methylene blue, and methyl green and violet) stain nuclei; whilst the acid ones (like orange-green) stain plasm, and the neutral ones (like rosaniline-picrate) stain special cell contents. Weigert, later, found that acid fuchsin was specially useful in the study of the nervous system, and Strasburger, the botanist, used the basic methyl-green to demonstrate those mitotic figures which are of such importance in embryological work and have afforded a basis for the wide generalisations of the biologist Weismann. Nor need I pursue the matter much further than to state that in 1882 Koch, who had previously devised the method of cultivation of bacteria, first stained with methylene blue and thus discovered the bacillus tuberculosis, the consequences and far-reaching results of which discovery are well known to all of you. That I have said so much on this point is to strengthen my contention that the true basis of modern medicine is essentially scientific. As an admirable instance of the kind of debt that modern medicine owes to bacteriology, of its power and promise, as also of the extreme difficulty and complexity of the subject in its recent developments, I cannot do better than to advise the re-perusal of Dr. Horton-Smith's Goulstonian Lectures on Typhoid Fever.

In surgery the discovery of the Roentgen rays has been of priceless benefit, and the Cheltenham Hospital was, I believe, among the first of provincial hospitals to make use of these rays, but most certainly Roentgen was thinking of nothing less than of surgery when in the modest Physical Institute of Würzburg he undertook his epoch-making research on the cathodic rays of Sir William Crookes. I have been to that modest but celebrated laboratory at Würzburg and heard there the true story of the discovery, which I must not here stop to relate, though I may remark that I have never seen it correctly reported in English.

I spoke of the antitoxins as among the most valued resources of remedial art, and it is to strictly scientific investigators, to such men as Löffler and Roux, Behring and Kitasato, Haffkine and Yersin, that we owe these great discoveries. Soon, I believe, we shall possess antitoxins for most of the febrile and infective diseases as undoubtedly effective as is that one now so successfully employed against diphtheria. Personally, I place much faith in the anti-typhoid inoculations of Professor Wright of Netley, and in the anti-tetanus serum; and I feel sure that many more equally effective and similar means will soon be in our hands against other diseases. But it is not the practical physician and surgeon who will discover them, but the intellectual devotees of pure science, steadily pursuing, through good and evil report, their self-appointed task of universal beneficence.

The animal extracts stand on a different basis, the basis of secretions destined not for excretion but for internal and bodily use, as first divined by Claude Bernard, and so indispensable that without them disease or discomfort at once arises. I forbear to do more than allude to the recognition of myxœdema by Sir William Gull in 1873, to its naming and the discovery of its connexion with an atrophic condition of the thyroid gland by Dr. Miller Ord in 1877, and to the discovery by Mr. Victor Horsley in 1890, of its antidote in thyroid transplantation, for which Dr. G. R. Murray of

Newcastle soon afterwards substituted subcutaneous injection of thyroid extract, and Dr. Hector Mackenzie the much pleasanter method of thyroid feeding. I likewise merely mention ovarian extract which often mitigates markedly the miseries of the menopause and suprarenal extract, which, with its extraordinary power of contracting blood-vessels and of consequently raising the blood-pressure, must necessarily have a great future in therapeutics. The animal extracts (not wholly unknown to the ancients though first studied in modern times by Brown-Séquard) have doubtless a great future in practical medicine, and ere long many more will be in use, though doubtless some already proposed will fall short of their promise and pretension.

In thinking of the standpoint of to-day I next recall the splendid work—purely scientific again—of the French and Italian investigators of malaria, of Laveran in 1880, and more recently of Marchiafava and Celli, Bignami and Grassi, but more especially of Golgi, who first proved that the feverish attacks coincided with the sporulation of the malarial amœbæ. To which I am pleased to add that it is, as you know, the President of our Tropical Diseases Section, Major Ronald Ross, who, following the promptings and surmises of Dr. Patrick Manson, has discovered nearly the whole life-cycle of the protozoon, and not only that, but has identified the true delinquent and disseminator of malaria with the mosquito anopheles, a fact subsequently demonstrated by experiment on a human subject by the celebrated Italian biologist, Grassi; and still more recently by the experiment at Ostia in the Roman Campagna, where Dr. Low and Dr. Sambon and three others living by night for four months in their mosquito-proof hut retained their health; whilst Mr. T. P. Manson and Mr. George Warren (courageous sufferers for science), who were bitten in London by infected mosquitoes from the Sancto Spirito Hospital in Rome, developed soon afterwards every symptom of malarial fever. It seems that the hæmamœbidæ of malaria pass the whole of their life-cycle between animals and mosquitoes, and Dr. McCallum of Baltimore has further supplied the missing link of their sexual reproduction in the mosquito only. But the original hæmamœba can hardly have evolved itself in either. Whence, then, can it have originated? That is a question which I cannot answer, though I may refer to the statement made by Captain L. Rogers, I.M.S., officiating Professor of Pathology in the Medical College of Calcutta, that where pure and filtered water is drunk there but little intermittent fever will be met with. At all events, it is quite clear that vertebrate animals are the immediate hosts of the malarial germ, and that it has hitherto never yet been found in water or anywhere else, save in mosquitoes and in some vertebrated animals only. Elephantiasis, whose hæmatozoon, the filaria nocturna, was discovered in the blood by Surgeon-Major Timothy Lewis in 1872, is distributed by another mosquito, the culex pipiens or culex ciliaris, as first proved by Dr. Manson. And even this does not exhaust the delinquencies of these dangerous insects, as there can be little doubt that they also disseminate yellow fever; witness the experience of the American army surgeons in Cuba, where that scientific martyr, Dr. Jesse W. Lazear, though isolated from yellow fever cases, yet died from it seven days after submitting to the puncture of an infected mosquito, and Dr. James Carroll, under similar conditions, narrowly escaped with his life. This particular mosquito has recently been recognised by the United States surgeons as the culex fasciatus, and it is probable that the transmission of yellow fever is due to it alone. The study of tropical diseases has, in fact, now become a refined department of biological investigation. Smith and Kilborne have shown the part played by ticks in disseminating the cattle fever of Texas, and ticks also are said to be responsible for the miana disease of North Persia and for a dysenteric fever of the Zambesi. Some forms of dysentery, as first suggested by Lösch in Russia in 1875, are probably originated by an amœba. In this town of Cheltenham old cases of malarial fever are often met with in returned officers and civilians, and I have yet to see the case that will resist six subcutaneous injections of three grains each of the acid hydrobromate of quinine.

What would have been the state of ophthalmology to-day without the invention in 1851 of the ophthalmoscope by the physicist Helmholtz? Then consider the benefits conferred by electricity. It may be that great results will follow some day from cataphoresis or the electrolytic introduction of drugs. There is no doubt in my mind as to the benefit in gynæcological work conferred by the treatment of Apostoli. Dr. Thomas Keith is not likely to have been mistaken in this matter, and what I have myself seen of permanent cures of really serious cases makes me feel sure that the Apostolian treatment for fibroids is not the delusion that some persons, who perhaps have not quite mastered it, proclaim it to be. It is, indeed, tedious, uncomfortable, and troublesome, and I for one shall be only too pleased if Sneguireff's simple treatment by superheated steam should prove itself an efficient substitute. Then there is the marvellously successful treatment of lupus by the chemical rays of the electric arc, devised by Finsen of Copenhagen, though it is a question again if these results are any better than those of Hannover, speedily obtained by a simple jet of heated air (atmocausis).

Where should we be without the scientific chemists?—to cite a few names only—Courtois, who gave us iodine in 1811 Balard, who gave us bromine in 1826; Serullas, who discovered iodoform in 1822; Soubeiran, who discovered chloroform in 1831; Liebig, who discovered chloral in 1832; and Neimann, who gave us cocaine in 1860? Not one of these was a practitioner of medicine or, unfortunately, a Briton.

More Universities and Research Institutions Needed.

I think that I have said enough to prove that the progress of pure science means medical progress also, and that it is to the men of pure science that we must still look to hold aloft for us the torch of progress. I can only hope that in the great advances still to be made Great Britain and Ireland may play their worthy part; but I confess that I have my misgivings unless some improvements are made in our educational arrangements. As the result of several recent August visits spent in many of the continental capitals I have been struck with the thoroughness and scientific spirit everywhere there manifested, being very different, I regret to add, from the anti-scientific spirit which characterises most of the wealthier and more cultivated classes in this country. This anti-scientific spirit is only eradicable by the better education of the young. To what other cause can we ascribe the fact that although the aniline dyes were discovered in 1858 by an Englishman, Dr. W. H. Perkin, yet almost the whole of their manufacture is now carried on in Germany. One company, the Badische Anilin und Soda Fabrik, employs 146 scientific chemists, 75 civil engineers, and 6300 workmen in one alone of its three factories. I know not if any words of mine will reach the eyes of those who govern in this country, but if they do I will implore them to give to our youth more facilities, similar to those enjoyed on the continent and in America. I know that much has been done and no fault is to be found with our primary education. The National Physical Laboratory and the Jenner Institute of Preventive Medicine have been established, the former in principle, the latter in reality, thanks to the splendid munificence of Lord Iveagh. New colleges, universities, and technical schools have been started and some 15 to 17 research scholars are appointed every year, one half of whom, I may remark, proceed at once to Germany to make their researches! What has been done, however, is as nothing to what ought to be done. The defences of the empire must not be overlooked, but of what avail will be those defences if our trade is gradually lost for want of exacter knowledge? For trade and medical progress and those very defences themselves rest entirely upon progressive science. Depend upon it, there is as much scientific ability and aptitude for research in the country of Cavendish and Priestley, of Faraday and Kelvin, of Darwin and Huxley, of Jenner and Lister, of Rayleigh and Ramsay, as in any foreign nation, but here the chances and opportunities are much fewer, and many a great discoverer that might have been, one of whom it might have been written that—

> "He broke his birth's invidious bar,
> And grasped the skirts of happy chance"—

spends his untrained energies in futile efforts and vain regrets and wholly wastes his commanding intellect for the want of instruction and opportunities easily accessible.

But the cost? It would be as nothing in proportion to the gain, and a Faraday, a Koch, or a Pasteur would be a cheap purchase at a million. Whereas France, Germany, and the United States educate at their universities approximately one student in every 1500 of the population, we in the United Kingdom are content with less than 1 in 2000. Whereas Germany spends £753,000 a year on its 22 universities and France £740,000 a year on its 16, we in

Great Britain and Ireland are content with less that one-fifth of that amount—namely, £135,339 among seven of our 13. Although the Leland Stanford University of California has received no less than £9,000,000 sterling from private munificence, and many others of the 480 American universities and colleges have likewise received huge sums—I may specify the Chicago University £2,000,000, the Johns Hopkins University £1,400,000, and the Cornell University over £1,000,000—no such general largesse is, I fear, to be expected from our British millionaires. The help must come from Government, supplemented by local contributions, or it may not come at all. Yet the matter is one of life or death for the country, for more and more every year the victory in every department and the predominance in arts and trades will pass to the possessors of the latest knowledge, the deepest science, and the most perfect and most economical processes. I cannot but believe that this great need will soon be remedied and that at the cost of a few battleships real universities of teaching and research, like the new University of Birmingham, will be established in every large town, and technical and research institutions—there are 25 of these in Germany and 43 in America—in most of the smaller ones. At present we are feeling keenly the competition of America, a competition that is not likely to diminish, for it possesses over 100 schools of chemistry and has 10,000 students of engineering. This competition we can only hope to resist by imitating the foresight, generosity, and enthusiasm for science of the American Governments and of the American men of wealth. And here I would wish to quote the words of Dr. T. K. Pearsons of Chicago, himself the donor of £800,000 to its University. "Monuments and monumental arches," he says, "once finished become dead memorials; their active function ceases. The school and college live, just as does the memorial in cold statuesque granite, but *their* functions never cease; education goes on from day to day, thinkers are moulded, the nation is served, humanity is benefited in the college." Oh, that these words may find a practical echo in this country. Examinations are of secondary consequence. China is the most examined country in the world, and look at it. Original work done under the professor's eye and at his suggestion is far better than any examinations and the true ideal of a real university must always be in the words of Paulsen, "*Die Erkenntniss der Dinge durch freie Forschung.*" ("True knowledge from free research.") Let us hope that we shall not have long to wait for many such universities, where the best and most practical scientific education will be open to all at low cost, as in the University of Michigan, where the fees do not exceed £7 a year, or at no cost at all, as in the State of Massachusetts, and in many of the Western States of America. There is no time to lose. The Consultative Committee on Education is, however, a good beginning, which I sincerely hope will soon be followed by the appointment of a Minister for Education, a functionary to be found in nearly every civilised State except our own. It is not trade unions and skilled workmen that can insure the continued prosperity of a nation, but the trained intelligences that direct its energy; and we may rest assured that whichever nation shall elevate highest the general standard of education will be the nation which will lead the world. Since the preceding section was written I have to record the magnificent—I hope it will prove infectious—generosity of Mr. Andrew Carnegie, with his gift of £2,000,000 to the Scottish Universities, one portion of it to be applied mainly to the teaching and endowment of research and the rest to replace the fees hitherto paid by their students. Happy Scotland, that not only receives about one-third of the whole Parliamentary grant for university education, but has found besides such a princely and far-seeing benefactor as Mr. Andrew Carnegie.

The Public Health Act of 1875.

Any reference to the medical standpoint of to-day were quite imperfect without some mention of the important position now happily assumed by the sanitary medical service; and it is a matter for legitimate pride that in this particular Great Britain was beforehand and set, by the Public Health Act of 1875, an example that foreign countries, with the exception of the United States and of Belgium, seem in no great hurry to imitate. In every town and district there is now a skilled expert who is the guide, philosopher, and friend of every household where epidemic disease makes its appearance. It is to the labours of such as he and to the existence of isolation hospitals that the great diminution in the zymotic death-rate is due. To his labours and to the increased cleanliness and better food of the population generally are due the gratifying diminution of the phthisical death-rate within 60 years from 38 to 13 per 10,000—the presage, I cannot doubt, of the total abolition at no distant date of consumptive and tuberculous disease altogether. And this, although Naegeli has recently proved that, at any rate as far as Zürich is concerned, 96 per cent. of the deaths under 18 in that town are due to tubercle. To Dr. Nathan Raw and to the guardians of Liverpool must be given the great credit of taking the first deliberate steps for the stamping-out of tuberculosis by establishing a rate-supported sanatorium near Heswall for the isolation and treatment of the consumptive poor—a good example, likely to be largely imitated soon throughout the country. Here I would wish to solicit a generous and helpful interest in the sanatorium of 60 beds to be built at Limpley Stoke, near Bath, in which the consumptive poor of the counties of Gloucester, Somerset, and Wilts will be treated with every advantage of hill air, full dietary, and modern science. Pure air implies at least no fresh infection; and high feeding, as so convincingly shown by Sir Hugh Beevor at the last annual meeting, occasions an enhanced resistance against the tubercle bacilli.

The originator of the method of high feeding and fresh air was undoubtedly Dr. George Boddington of Sutton Coldfield, by whom it was devised and carried out with great success so long ago as 1836. Most of the credit, however, of advocating persistently and quite independently the necessity and importance of fresh air must be given to the father of the distinguished recent President of the Royal College of Surgeons of England—namely, to Dr. Henry MacCormac of Belfast, whom it was my privilege to know in my youth, and well do I remember his striking book, "Consumption and the Breath Re-breathed." Like Semmelweis, the earliest of antiseptic obstetricians, and like Harvey, whose subversive discovery only brought about the loss of most of his practice, Dr. MacCormac excited at first opposition and ridicule only. The more reason, therefore, that full credit should now be given to the impassioned and eloquent advocate of fresh air, who anticipated by more than half a century some of the best knowledge and practice of to-day. Here, then, is a method half English and half Irish in its conception, however much it may have been pushed and popularised during recent years in Germany. And there can be no doubt as to the cures. Soon after Koch's discovery of the bacillus tuberculosis I looked for it and found it at once in phthisical sputa, and each finding was sentence of death; but now it is found as a simple matter of diagnosis to disappear completely and often finally at the completion of the cure by fresh air and high diet. Of the contagiousness of phthisis I can entertain no doubt whatever, and the greatest care should be taken to destroy sputa. Remembering the liability of birds to phthisis Dr. Tucker Wise's cautions as to cage-birds should not be forgotten. Indeed, the connexion of the lower animals with our diseases must never be overlooked. The "harmless necessary cat" is quite often the conveyor of diphtheria, the dog always of hydatids, and the rat often of plague. "No rats, no plague," it has been said, and he who would exterminate his city's rats would do much to insure his city's immunity against the plague. In the case of Glasgow, however, it is right to add that the rats were guiltless.

Aspirations, Ethics, and Conclusion.

And now for a few concluding words about the aims, the aspirations, and the ethics of the profession. After a long and expensive education, after knowledge acquired laboriously and at great personal risk (the clergyman's death-rate is 16 per 1000, the lawyer's 20 per 1000, and the medical man's, 25 per 1000), the medical man must not hold himself too cheaply. He is the heir of a long tradition, originating from the sages of India and from the temples of Greece. Our health and happiness are in his hands and the issues of life and death tremble often upon his judgment. So he must bear himself with confidence and proper pride, remembering his great traditions and the antiquity of his calling, which ranks next to that of priest. He is worthy of his hire and that hire should be such that in the day of his popularity he may make due provision for his age and retirement and for those whom he will leave behind him. He must work hard and read and think all the days of his practising, for the best practice of to-day will not be that of even five years hence. His aspirations must be for the very best in each department of practice, for the progressive

advancement of his art, and for the increased dignity and consideration of his calling.

Above all, let him be chary of any commerce with the enemies of science. *Magna est scientia et prævalebit.* None the less serious is his responsibility who, knowing its benefits, yet retards its progress, or who ignorantly would deny to others what he is insufficiently instructed to understand for himself. Beware of panaceas. There are none in truth, though the worship of Panacea was not confined to Ancient Greece and is as reprehensible in the cold clear light of twentieth-century science as is the equivalent assumption by too many of specialist omniscience.

The wise practitioner will strengthen his position, as he will certainly increase his knowledge by somewhat frequent consultations, and he will do well if, like Hunter and Jenner, he cultivates some extraneous intellectual interest to relax occasionally the stress of his anxious labours. I venture to think that nothing will do him more good than the pursuit of one or other of the arts, or of some branches of biological or physical distraction, be it zoology or botany, electricity or telescopy, for

> "Neque semper arcum
> Tendit Apollo."

And the quotation is apposite, for was not Apollo the first physician and the father of Æsculapius, and does he not say of himself in *Ovid*—

> "Inventum medicina meum est, opiferque per orbem
> Dicor, et herbarum subjecta potentia nobis"?

The wise practitioner, moreover, will confine his studies within certain limits if he wishes to attain to a thorough knowledge of even some portions of his great subject. He cannot be a universal specialist, and I would commend to your consideration the admirable advice contained in one of Goethe's sonnets:

> "Wer grosses will, muss sich zusammenraffen;
> In der Beschränkung zeigt sich erst der Meister."

For which I would propose the following English equivalent:

> "Who would be great must pull himself together;
> The Master shows himself in limitation ever."

The good and worthy practitioner will never be wanting in sympathy. Too often there is physical pain to be relieved, and, thank God, it can be relieved; though at other times the sufferings will be nervous rather than physical; and these are the occasions when sympathy and patience are most needed, though it is not always easy to show the first and to retain the last in the interest of some nervous sufferer on a cold wet night at 3 A.M.

In respect of medical ethics the case is very simple. Treat and think and speak of your brother practitioners as you would wish them to treat and think and speak of you. Medical ethics are, indeed, so completely summed up in this single sentence as to make it quite unnecessary for me to read to you the section that I had written on this subject. With high aims and aspirations, with true ethical, that is to say, brotherly, feeling, and with constant consideration for the public weal, we shall each and all be worthy of the well-known description in Chaucer, and be "veray parfit practisours," though I hope it will not be said of us, as it was of that particular one, that

> "His studie was but litel on the Bible."

No; we will read Ecclesiasticus, though not Ecclesiasticus only, in the hope that it may be said of each of us in the words of an old poet who was writing of a good and brave physician of his day:

> "He holds no parley with unmanly fears,
> Where duty calls he confidently steers,
> Faces a thousand dangers at her call,
> And trusting in his God surmounts them all."

After Providence, ladies and gentlemen, reason is and must necessarily be our daily guide, for which cause it is consoling to recall the words of one of the greatest of French writers:

> "La Raison triomphe de la mort, et travailler pour elle,
> C'est travailler pour l'éternité."

And if I have mentioned the word *la mort* it will but afford me the opportunity of concluding with my solemn conviction, as best expressed in the words of Longfellow:

> "There is no death! what seems so is transition;
> This life of mortal breath
> Is but a suburb of the life elysian,
> Whose portal we call death."

SECOND GENERAL MEETING.

The second general meeting was held in the Princess Hall of the Ladies' College on Wednesday, Dr. G. B. FERGUSON, the President, presiding.

The announcement was made that the next meeting of the Association would be held at Manchester next year, and Mr. Walter Whitehead, F.R.C.S. Edin., the President-elect, gave a most cordial invitation to the members of the Association on the part of the medical profession of Manchester and its neighbourhood.

The next item on the agenda was to receive the report of the representatives of branches, but the meeting insisted on passing at once to the consideration of

The Report of the Constitution Committee.

Mr. EDMUND OWEN, the chairman of the committee, in moving the reception of the report, said that the Constitution Committee was not a "packed" committee—the members represented England, Scotland, Ireland, and Britain beyond the seas. The attendance was excellent, for the members from all quarters of the empire attended a little more than seven out of the total number of nine attendances. When he (Mr. Owen) was appointed his friends said that he was running great risks because Mr. Horsley was on the committee. On that point he had to say that Mr. Horsley had served on many committees, and the British Medical Association was beginning to know what they owed to Mr. Horsley, but the profession at large did not know it. Mr. Horsley was a simple-minded man; he had no axe of his own to grind; he was not seeking personal advancement but was always ready to fight the battle of any part of the British Medical Association that was in distress. Mr. Horsley's conduct in the committee was quite admirable; he did not go to sleep and he would take it as an affront for a chairman to go to sleep, and he would advise any chairman on a committee with Mr. Horsley not to fall to sleep. After complimenting Mr. J. S. Whitaker of Yarmouth on the assistance he had rendered the committee Mr. Owen explained that the Association was a limited liability company.

Mr. VICTOR HORSLEY said he would like to commend to their notice the report of the Constitution Committee. At Ipswich they passed the resolution for the appointment of the committee to consider the reorganisation of the Association. He knew that while that committee was at work many members of the Association, like many members of the committee, felt that a very heavy and responsible work was being done within the Association. Further, they felt that it was the work of the profession and not merely that of this Association. Their members now had reached such a figure that they could refer to themselves as the "body" of the profession. He was sure that the Constitution Committee, in presenting this report, were anxious that they should realise how representative their discussions were. They wished to make this Association so representative in character that when on the rare occasions that the Association met its vote in general meeting assembled should go forth to the general public as being what the profession wanted. He had served on a committee of this Association on a burning question which he would not mention by name under these circumstances, and the most difficult position of the members of that committee was that they had no means of ascertaining what were the wishes of the members of the Association, let alone the ideas that prevailed in the profession as a whole. There was no means of getting at the wish of the profession. They were in this position—they were mighty in numbers but most weak in influence. Surely the recent proceedings in the House of Commons should be enough to remind them of their powerlessness in the way of coöperative influence. Under these circumstances the committee had worked and he had simply to commend to their favourable consideration the report of that committee. He had much pleasure in seconding the resolution:—

That the report of the Constitution Committee be received.

This motion was carried, as also was the next which was as follows:—

That this meeting, without prejudice to the further consideration of details, approves generally of the scheme of reorganisation proposed in the report and recommendations, including the principle of reorganising the constitution of the Association under the Companies' Acts, of instituting divisions, of enrolling all members in the divisions and branches, and of instituting a representative meeting and transferring thereto as much as possible of the business hitherto brought before the general meeting.

This motion having been carried the recommendations of the committee were submitted *seriatim* and the first 15 were passed without any alteration except that of making "fourteen days" in Clause (*b*) of Recommendation 8 read "twenty-eight days."

Primary Unit.

1. That the primary unit of organisation of the British Medical Association be such that every member of a unit shall have a reasonable opportunity of attending every important meeting thereof, and that such unit be called a "division."

Divisions.

2. That in the United Kingdom the members resident within the area of each branch be grouped in divisions in such manner as may be decided upon by the branch with the sanction of the Council of the Association, regard being had (*a*) to the wishes of the general body of members in each district and the means of communication by rail or otherwise, (*b*) to the desirability, for more effectively carrying out the work of the Association, of the boundaries of divisions being made to coincide as nearly as possible with those of Parliamentary constituencies or groups of constituencies.

Divisions—Indian and Colonial.

3. That in the colonies and India divisions be formed by each branch in accordance with the general principle of recommendation (1) where the local special conditions permit, but that where existing branches remain undivided with the approval of the Association each such branch be regarded also as a division for the purposes of these recommendations.

Branches.

4. That the divisions be combined to form groups called branches, the desires of divisions being complied with in the grouping so far as is compatible with efficiency of organisation and the general interests of the Association. That the boundaries of branches be made eventually to coincide as nearly as possible with those of counties or groups of counties, but that for the present time the existing branches be taken as the basis of rearrangement and act as such groups of divisions for the purposes of these recommendations.

Membership of Local Organisation.

5. That every member of the Association be *ipso facto* an ordinary member (hereinafter called a member) of the division within the area of which he resides and of no other.

Election of Members through Branches.

6. That the election of new members resident within the area of a branch be through that branch only, and that the rule relating to the election of such members be to the following effect:—

Qualification for Membership.

Any registered medical practitioner may be elected a member of the branch and of the Association by the branch council provided that he has applied for election in writing to the branch secretary, stating his agreement if elected to abide by the regulations of the Association and of the branch and division to which he may at any time belong and to pay his subscription for the current year, and that notice of his proposed election has been sent to every member of the branch council not less than one month before the meeting thereof at which such election is to be considered.

Complimentary Members.

7. That any branch or division have power to elect as a complimentary member any member of the Association not eligible by residence for ordinary membership of such branch or division, and that any colonial or Indian branch or division have power to elect as a complimentary member any qualified medical practitioner resident within the area thereof, but not eligible by birth and qualification for membership of the Association; that complimentary members be not permitted to vote as members of the branch or division, but otherwise have such privileges of membership as may be conferred on them.

8. That the rule relating to expulsion be to the following effect:—

Expulsion from Association.

(i.) Any member of the Association who shall have been convicted in a court of justice of any felony or misdemeanour, or whose name shall have been erased from the Medical Register under Section 29 of the Medical Act, 1858, shall, *ipso facto*, cease to be a member of the Association.

Expulsion by the Council.

(ii.) (*a*) The Council shall have power in all cases, on the representation of any branch and after due inquiry, of which the member involved shall have received due notice, to expel any member whose conduct is held to be detrimental to the honour and interests of the medical profession and calculated

Majority required.

to bring the profession into disrepute; but a majority of two-thirds of the members of the Council present and voting shall be required for this purpose.

Expulsion by Indian and Colonial Branches.

(*b*) In the case of colonial and Indian members each local branch shall have power to expel from membership of the Association any member of such branch whose conduct, after due inquiry at a special meeting convened at not less than one month's notice, shall be declared by a majority of two-thirds of members present and voting at such meeting to be detrimental to the honour and interests of the medical profession and calculated to bring the profession into disrepute. The name of such member shall be notified to the general secretary and shall be forthwith erased from the Register of Members of the Association kept at the central offices of the Association, unless such member shall appeal within 28 days to the Council to hold a further inquiry, and pending such inquiry by and decision of the Council his membership shall be suspended.

Non-acceptance of Resignation.

(iii.) No member whose conduct is under investigation or is the subject of any inquiry by a branch or by the Council shall be allowed to resign his membership of the Association until the decision of the branch or Council be made known.

Composition of Branch Council.

9. That the Council appointed to administer the affairs of any branch consist of the representatives elected by the branch to serve on the Council of the Association, of representatives of every division in the branch, and of such officers and other members as the branch may think fit to appoint thereto. That the number of representatives of each division on the branch council be as nearly as possible in proportion to its membership.

Division Administration.

10. That any Executive Committee or Council appointed to administer the affairs of any division consist of the representative of such division in the last preceding annual meeting, of the representatives of the division on the branch council, and of such officers and other members as the division may think fit to appoint thereto.

Reports of Status of Branches and Divisions.

11. That each division furnish annually to the branch council, and each branch to the central council, a report of its proceedings during the year, its numbers, and its financial position.

Branch By-laws and Rules.

12. That all branch and division by-laws and rules be submitted for approval to the Council of the Association and do not come into operation until approved by the said Council.

Local Autonomy.

13. That subject to the above provisions and to the fundamental laws of the Association, as declared in its articles and by-laws, each branch and each division be free to govern itself as it shall think fit.

Central Council Composition.

14. (i.) That the Council of the Association consist of the President, President-elect, past-president for the year following his year of office as president, and treasurer, all *ex-officio*, of representatives elected by the branches, as hereinafter provided, of one representative each elected by the members of the Association attached to the Royal

Naval and Military Representatives.

Navy Medical Service, the Royal Army Medical Corps, and the Indian Medical Service respectively, and of members, to be not more than

Coöpted Members.

one-tenth of the elected members, annually coöpted by the Council, the same member not being coöpted for more than five years successively.

(ii.) That in general each branch or group or branches having an aggregate membership of not less than 200 return one representative, and each branch or group of branches having an aggregate membership of not less than 400 return two representatives, and an additional representative for each complete 600 members in excess of 400; that branches in the United Kingdom having less than 200 members be grouped with neighbouring branches for the purpose of representation on the Council, but that the Council have power to grant separate representation to such branches where special conditions appear to the Council to justify this measure.

Election.

(iii.) That the representative members of Council be elected by voting papers sent to each elector by post, the said voting papers containing the names of those candidates who have been nominated each by three electors in writing to the secretary on or before an appointed day of which not less than 14 days' notice has been given in the *Journal*.

Eligibility for Re-election.

(iv.) That the term of eligibility for continuous office as a representative member of Council be limited to eight years, after which a term of one year's ineligibility as a representative member shall ensue.

Term of Office United Kingdom Branch Representatives.

(v.) That the representatives of branches in the United Kingdom on the Central Council be elected for one year and be eligible for re-election subject to the provisions of sub-clause (iv.)

Colonial and Indian Branch and Service Representatives.

(vi.) That the representatives of colonial and Indian branches and of the Royal Navy Medical Service, the Royal Army Medical Corps, and the Indian Medical Service on the Central Council be elected for such period, not exceeding three years, as each such branch or body may determine, and be eligible for re-election subject to the provisions of sub-clause (iv.).

Powers of Council.

15. That except as herein otherwise provided the management of the affairs of the Association be vested in the Council subject to the provisions of the articles and by-laws of the Association.

THE SECTIONS.

MEDICINE.

WEDNESDAY, JULY 31ST.

The Presidential Address.

Dr. E. T. WILSON, physician to the Cheltenham General Hospital and to Cheltenham College, opened the work of the Section of Medicine with the following introductory remarks:—

The Value of Research in Medicine and Therapeutics.

In offering a few informal remarks by way of preface to the real work of the section my first impulse is to express my deep sense of the honour which has been conferred upon me by my professional brethren in electing me to this chair,

with which so many names honoured in medicine have been associated; my second is to add a few words to those of the President, bidding a hearty welcome to all who from far or near have come to visit our good town of Cheltenham, wishing them that healthy combination of work and enjoyment which it is the object of these annual meetings to afford. Here we mark time, as it were, and take stock of the work done in our several departments. The experimentalist and the specialist meet with the general practitioner on a common platform with the best results. The times are favourable to such conferences. Increased facilities for communication and for the interchange of thought have in a sense annihilated space. The rapid evolution and general trend of modern medicine are shown by the way in which this section has of late years outgrown its ancient landmarks, throwing out colonies, as it were, in the Sections of Pathology and Bacteriology, Tropical Diseases, Diseases of Children, and others more specialised, which in some instances threaten to rival the parent in interest. The subjects which are to engage our attention in this section during the next few days deal with questions on which more information is urgently needed. The discussion on joint disease treats of disorders which are probably among the oldest known to humanity and opens up the whole question of infection by micro-organisms with which some of the papers in this section also deal. The second subject set down for discussion—Peripheral Neuritis in Beer-drinkers—is essentially modern, and although it is under investigation by a Royal Commission we shall have the advantage of hearing the views of gentlemen who are thoroughly conversant with the facts. Other papers there are dealing with therapeutics and among those one on the Cheltenham waters which flow unchanged, though mercilessly stripped of all the accessories appertaining to a spa. They would no doubt prove efficacious as of yore on the old conditions:

> "Cure vacuus hunc adeas locum
> Ut morborum vacuus abire queas;
> Non enim hic curatur qui curat."

A paper on Malaria was hoped for; but the prior claims of the Tropical Section could not be questioned, for, although the tests which finally led to its conviction were applied on the Campagna of Rome, the guilty anopheles was arrested in India, and its prosecution followed up in the equatorial regions of Western Africa. This remarkable investigation is one of the latest contributions which microbiology has given to medicine and presents a signal example of the rapidity and thoroughness of modern methods. Activity prevails in every department of medicine and surgery, but in none have so many valuable results been obtained, in none have so many hopes been excited as in the scientific study of the infective diseases, of the exotic fauna and flora of the human body. The bacteriological diagnosis of certain diseases has become a matter of routine, and there can be little doubt that in the near future a need will arise for laboratories and specialists in every large centre of population, to whom questions insoluble or doubtful in their clinical aspects may be referred, on whom will rest also the responsibility for the supply of such vaccines and serums as may be required in their several districts. An improved diagnosis, however, is but a small portion of the gain which has been derived from a scientific investigation of the causes of disease. Over a large part of the field of therapeutics a new direction has been given to treatment. We are learning to look beyond the collection of symptoms which were once held to constitute the disease, with the result that, although symptoms will continue to claim our attention, and certainly that of our patients, the true objective of treatment will be the micro-organism itself. We are learning more and more at the hands of a new pathology to regard the human body as a battle-ground on which important issues have to be fought out between invading organisms and poisons coming from without, on the one hand, and on the other those forces inherent in the system, of which so little is known as yet, but which may be summed up in the term "resistance," or in one older and better known, the "*vis medicatrix naturæ*." Every disease which can be won over for the infective class becomes at once, if only in theory, preventable, and our treatment acquires a tangible and definite aim. In the first line of defence comes the destruction of the parasite before it obtains a lodgment in this body, and this will be divided between the health officer and the medical attendant, for it comprises the whole array of hygienic measures, including the isolation of the infected sick. Our means of attacking the parasite within the body are at present limited in extent, but some progress has been made—as, for instance, in the treatment of lupus by sun exposures, of rodent ulcer by the x rays, and of tuberculosis of the lung by life in the open air. An additional defence is found in the vaccines by which immunity, artificial or natural, is secured, such as the Cuban enjoys against yellow fever or the vaccinated with cow-pox against variola. In serum-therapy we again appeal to powers which cannot at present be explained, whereby for each several toxin produced by an organism in the blood a special antitoxin is forthcoming, and it is the possibility of supplementing this supply by artificial means which has deprived diseases, such as diphtheria and tetanus, of the terror with which they were wont to be regarded. Lastly, behind all these, we have in reserve the enormous powers residing in the blood-cells of offering a successful resistance to the invading organisms—a resistance the vigour of which is easily impaired by unfavourable circumstances, and which it will become more and more the aim of medicine to foster and improve. The number of the infective diseases is by no means complete and it becomes almost possible to breathe a word of hope where despair has hitherto prevailed, that medicine may yet find work to do in the treatment, preventive it may be, of the neoplasms which occur with ever-increasing frequency. The cancer which the surgeon now removes with such consummate skill is not the disease; it had its beginnings in an insignificant outgrowth, during which the rapidly proliferating cells, estranged from their accustomed environment, would probably be vulnerable did we know how and where to attack them; and further back still lies the exciting cause, on the exact nature of which medical opinion is divided; there seems, however, good ground for suspecting that here, too, we are confronted with a micro-organism and an infective disease the remedies for which, though they be long in coming, cannot be regarded as beyond the reach of human attainment, for—

> "Let that man with better sence advize,
> That of the world least part to us is red;
> And daily how through hardy enterprize
> Many great regions are discovered.
> * * * * *
> Yet all these were when no man did them know,
> Yet have from wisest ages hidden beene,
> And later times things more unknowne shall show;
> Why, then, should witless man so much misweene
> That nothing is but that which he hath seene?"

Dr. Wilson concluded an eloquent address by pointing out that in modern medicine the use of drugs—"the offspring of a wise empiricism"—had been unduly discredited, while the art of prescribing was falling into decay. Medical men, he considered, should take combined action to settle certain therapeutic questions.

Chronic Diseases of Joints usually Comprised in the Terms Chronic Rheumatism, Osteo-arthritis, and Rheumatic Gout.

Dr. A. E. GARROD (London) then opened a discussion on this subject and said that the joints were so readily accessible to examination that their diseases attracted attention very early, and there was an immense amount of literature on the subject. It was very difficult to avoid preconceptions when approaching this subject, but it was absolutely necessary to do so. Acute rheumatism had been in turn regarded as a purely local affection of the joints, as a humoral disease, and finally as a specific infective fever, and similar changes of view had taken place with regard to the diseases now under discussion. There were many diseases of the joints which did not come under this heading. The arthropathies of bacterial infection, pyæmia especially, that form caused by gonococci, and others, as well as those accompanying certain diseases of the spinal cord, were instances in point. The nomenclature of these diseases was not satisfactory. The name of "rheumatoid arthritis" suggested a causal connexion with rheumatism; the name of "arthritis deformans" was less open to objection. In the same way the treatment of these affections was dominated by theories of gout and the name "rheumatic gout" had contributed to this. Certain changes were found in necropsies in these affections and the question that had to be decided was, are all these changes the result of one and the same morbid process? He distinguished two distinct forms—the first occurring more especially in women at the earlier periods of life, affecting first the smaller joints, and forming fusiform swellings which had a crackling sensation on palpation. Muscular atrophy was an early symptom; it seemed particularly apt to follow

debilitating causes, such as influenza. Its progress might be either rapid or slow, the fever might be considerable or slight, and pigmentation of the skin was usually present; visceral lesions were the exception, but albuminuria might occur. Post-mortem examination showed that the synovial membrane was more involved than the cartilages. The morbid anatomy of this form was not well known, and more work was very urgently needed in this direction. He compared this form, to which he referred afterwards as the fusiform variety, to that in children described by Dr. Still. He also reserved the term "rheumatoid arthritis" for this variety. The second variety, also occurring mostly in females, came on at a more advanced period of life; the terminal joints and the carpo-metacarpal joints of the thumbs being those usually first affected. It was neither so painful nor so rapid in its course as the former variety. Eventually many joints became involved, and in place of the crackling they got grating in the joints and eburnation of the ends of the bone after absorption of the cartilage. He thought that these two forms were not identical; they were different from the commencement and he preferred to reserve the term "osteo-arthritis" for the second variety. He thought that the joint affection confined to single joints was a distinct disease. Many people considered that these diseases had an intimate connexion either with acute rheumatism or with gout and he thought that the nodular disease of old persons was rheumatic. The fusiform variety was not due to the results of acute rheumatism. They might get severe or slight peri-arthritis, but, as a rule, there was no acute rheumatism in rheumatoid arthritis and the heart was seldom affected. Though rheumatoid arthritis has occasionally followed acute rheumatism he could not see that there were any sound clinical grounds for thinking that acute rheumatism caused rheumatoid arthritis. The rheumatic nodules in rheumatoid arthritis were not like those of acute rheumatism. The distinction between the two diseases could not be settled by clinical methods. Bannatyne and others seemed to show that if there were bacteria in the diseased joints those in cases of acute rheumatism were not the same as those of rheumatoid arthritis. They should never forget that osteo-arthritis was not connected with gout or rheumatoid arthritis with acute rheumatism. If he was right in distinguishing between the two varieties it was clear that they could not have a common cause. He recommended an expectant attitude on the question, waiting for demonstration of the specific bacteria of the different forms of the disease. With regard to treatment, all forms were very refractory. He considered that we should try to exclude any debilitating conditions, such as menorrhagia or dyspepsia, and any unhealthy condition of the teeth or gums. These forms of disease should be treated with a low diet, and stimulants were generally required. In rheumatoid arthritis the patient's strength should be kept up, and tonics given, but in such a form as not to upset the digestion. Cod-liver oil and arsenic were useful, but all methods of treatment should be continued for a considerable time even though they were not immediately successful. Osteo-arthritis was less amenable to treatment though its progress was slower; the indications in this latter disease were to delay its progress as much as possible, though he confessed that he had never seen any particular benefit arise from any form of treatment. He submitted the three following points for consideration: 1. Are there two distinct forms of the disease? 2. Are either of them connected with rheumatism or gout? 3. What are the best methods of treatment?

Professor OSLER (Baltimore) emphasised the necessity for approaching the study of these diseases without bias and from a mutual standpoint. If there were not two diseases there were, at any rate, two well-marked varieties. In the cases among children described by Dr. Still there were well-marked affections of the liver, the spleen, &c., which he (Professor Osler) thought proved that we were dealing with a condition quite different from the above form. He agreed with Dr. Garrod as to the distinctive points of the two varieties. He mentioned other varieties which had been differentiated by foreign observers, but he objected to these varieties being called different diseases.

Mr. W. ARMSTRONG (Buxton) described some cases which he considered to bear out some of Dr. Garrod's remarks.

Dr. A. P. LUFF (London) thought that rheumatoid arthritis was not an uncommon sequela of rheumatism, but that it was a distinct disease. The treatment of rheumatoid arthritis was quite different from that of acute rheumatism. Salicylates were valueless in the former disease. He considered it was possible to treat rheumatoid arthritis with success, but we must always remember that we were dealing with a microbic affection of joints. We must try to differentiate between all the different forms of arthritis. As against the neurotic theory of the causation of rheumatoid arthritis he submitted that it was not symmetrical in early stages; he considered the muscular wasting to be simply due to disuse. There was no reaction of degeneration in the atrophied muscle and no nerve-lesion had ever been demonstrated. It was possible that a nervous affection might predispose to bacterial invasion by lowering the nutrition of the joints, and he mentioned that he had under his care at present six cases in which rheumatoid arthritis had followed the removal of both ovaries. He regarded the mono-articular cases as a different disease and probably not microbic in causation. With regard to treatment, he thought that he had secured the best results from the application of radiant heat. He advised a good and generous diet, a red wine, and for drugs iodide of potassium and some guaiacol preparation—say, the carbonate—commencing with three doses daily of five grains each and working up gradually to about 45 grains per diem.

Dr. W. P. HERRINGHAM (London) said that there were two questions before the meeting. The first was the diagnosis of osteo-arthritis from acute rheumatism, and secondly, the pathology of osteo-arthritis. An acute attack of osteo-arthritis was very like acute rheumatism. In both there were rash, pain, and fever, and both were relieved by salicylates. Time alone would reveal the nature of the case. He could not quite agree with Dr. Garrod that there were two distinct varieties of the disease; he thought that the points of resemblance were more numerous than the differences. He granted that in elderly people the disease attacked chiefly the bones and in younger ones the synovial membrane, and in Dr. Still's cases of children the large glands were involved; but he was inclined to think that the differences were not in the diseases but in the patients. In old age diseases came to be more chronic; in children we got inflammation of epithelial surfaces while in older patients we got fibrous degeneration. He thought that there were not sufficient grounds at present for deciding whether these diseases were distinct or what the true pathology of osteo-arthritis was.

Dr. C. O. HAWTHORNE thought that there was chronic rheumatism of the joints and that it was incorrect to say that these cases were never rheumatic.

Dr. E. J. CAVE (Bath) thought that many clinical kinds of arthritis might be produced by the same poison and conversely identical clinical forms by different poisons. He had seen a case of rheumatoid arthritis produced by infection from a case of severe rectal ulceration. He considered that if we looked with sufficient diligence for an antecedent cause for rheumatoid arthritis we should, in most cases, be able to discover one. With regard to treatment he thought that serum-therapy would prove the hope of the future.

Dr. SAMUEL WEST (London) considered the discussion of the subject to be difficult, since observers were not agreed on a basis of classification. Few varieties of joint lesions could be expected to be found post mortem and various causes must produce identical ones. He thought that it was most important to recognise as early as possible the existence of any such cause as that mentioned by Dr. Cave, whose remarks he considered to be most valuable. He also considered that the cause of infection in most cases could be found and therefore they ought to search for them diligently. He quoted a case of his own in which the only local cause that could be discovered was a very slight cystitis; but after curing the condition of the bladder the arthritis disappeared. He mentioned the connexion of joint disease with empyema, and concluded by saying that he thought that in many cases various bacterial forms might produce the disease.

Professor R. SAUNDBY (Birmingham) endorsed Dr. West's remarks; he was inclined to take gonococcal rheumatism as the type of these cases, and other infections acted in a similar way.

Dr. W. CALWELL (Belfast), Dr. ELIZA DUNBAR (Bristol), Dr. SARAT K. MULLICK (London), and Dr. PRESTON KING (Bath), took part in the discussion.

Dr. GARROD, in reply, thought that the discussion would do good; he thought that during its course we had got a little out of a fog and that several peaks had emerged. Comparing this discussion with one six or seven years ago he noticed

an advance in general professional opinion towards a more scientific view of these cases.

The PRESIDENT closed the discussion in a few words.

Escape of Cerebro-Spinal Fluid from the Nose.

Dr. WATSON WILLIAMS (Bristol), and Dr. W. S. V. STOCK (Bristol) showed a patient who had an Escape of Cerebro-Spinal Fluid from the right nostril; there were no bad symptoms, but the continual flow was a nuisance to the patient. It commenced quite suddenly about four months ago and had continued ever since. Clinical tests showed it to be undoubtedly of the nature mentioned and not to be the fluid of a nasal hydrorrhœa.

Dr. STCLAIR THOMPSON (London) thought that the disease was very rare, but accurate diagnosis was necessary, or treatment might be employed which might be injurious to the patient.

Professor OSLER suggested lumbar puncture as a possible means of alleviation.

Dr. A. P. LUFF read a short paper

On the Composition and Therapeutic Uses of the Cheltenham Waters,

and said that his object in doing so was to induce practitioners to make more use of home spas. He wished that the corporation of Cheltenham could see its way to restore the spa as it formerly existed. Many cases which were sent to Carlsbad, Kissingen, Wiesbaden, Marienburg, &c., could be better treated at Cheltenham. There were two principal varieties of the waters—the first contained much sodium chloride and sodium sulphate, was a cold water, and resembled that of Marienbad; the other was a water containing a considerable amount of magnesium sulphate and sodium sulphate. The waters were useful in chronic constipation, obesity, and dyspepsia; and while they were not suited for articular gout they were very useful in irregular forms of that disease, such as intestinal catarrh, glycosuria, and also rheumatoid arthritis. The summer season was the best, though many thought that the town at that time was relaxing in its climate—an opinion which he knew, however, was not shared by the distinguished president of the section. But if Cheltenham were ever to attain the position as a spa and health resort to which the therapeutic value of its waters undoubtedly entitled it the spa should be provided with all those modern appliances and aids, such as baths of all kinds, massage, radiant heat, &c., which had done so much to restore the watering places both here and abroad to professional and public favour. The waters of Cheltenham were as good as ever, and if the authorities would bestir themselves their fame would be again re-established.

SURGERY.

WEDNESDAY, JULY 31ST.

Mr. REGINALD HARRISON (London), surgeon to St. Peter's Hospital and President of the Section, in place of a presidential address, opened the first debate of the meeting upon

Renal Tension and its Treatment by Surgical Means.

I drew attention in 1896, he said, to some cases where patients suffering from albuminuria and other renal symptoms which might have been produced by a stone or other removeable cause had completely recovered after an exploratory operation on the kidney by puncture or incision, though no calculus or recognisable cause was discovered. It seemed reasonable to infer from these results, as well as from the examination of the parts operated upon, that this satisfactory termination might be ascribed to the relief of tension and congestion, thus allowing the escape of that which caused these conditions and permitting the return of a natural circulation in the organ. Further, I urged that the recognition of tension as a factor in kidney disease had not hitherto received adequate attention and that its consideration might lead to some revision in our views relative to renal pathology and treatment. I propose to deal with this subject now briefly under three headings:—1. What grounds are there for believing that the immediate effects of tension may be, amongst other causes, the starting-point for some of those pathological changes in the kidney which are included under the term of Bright's disease or nephritis? 2. In what class of cases are there reasons for thinking that direct surgical intervention for the relief of tension and its effects is applicable, and how are we to arrive at this conclusion. 3. In what manner should the latter be practised?

In reference to the first point it must be borne in mind that the more recent information we possess about certain pathological states of the kidney has been mainly derived from the actual inspection of the organ during life and from the impressions conveyed by touching or handling it. The effects of tension as a factor in renal disease could not be fully appreciated until a living kidney could be explored *in situ*. The question has been raised, How is it that the tension of acute nephritis never or rarely proceeds to suppuration or gangrene, as happens elsewhere in the body? The answer is obvious. These extremes are anticipated by death. There is another phase connected with pathological lesions of the kidney which should not be lost sight of. In my Lettsomian Lectures delivered before the Medical Society of London in 1888 I showed that it was not uncommon to find either as a consequence of direct injury or disease that the lining membrane of the urethra had, at one or more points, lost its power of transmitting urine without some degree of slow leakage or exudation of certain of its constituents in the direction of the peri-urethral tissues occurring. I attributed this to the destruction of the epithelial coat, which was found to be completely absent at these points. This led to lymph barriers being thrown out in the peri-urethral tissue which by their subsequent organisation and contraction formed strictures and indurations, and sometimes by their extent involved the perineum. The same, I believe, may happen in the inflamed kidney as a consequence of tension, and by the slow exudation of urine tend in aiding its disorganisation. Apart from evidence to be obtained from ocular and digital exploration of the kidney, which will be referred to later, there are some important analogies bearing upon internal tensions which must not be passed by unnoticed. Probably the most striking one is the relation of intra-ocular tension to certain diseases of the eye. The recognition of the true pathology of glaucoma and the adoption of mechanical treatment by iridectomy, or an allied operation for the removal of tension and the prevention of the degenerative changes thus initiated, at once resulted in the saving of a large number of eyes which previously to this discovery would undoubtedly have been lost. By this means Von Graefe converted an incurable disease into a curable one and at the same time demonstrated the true nature of the disorder. Hence it has been suggested to me that the term "renal glaucoma" is not an inappropriate one. Again, in the testicle, when it becomes inflamed, we have not unfrequently transient as well as permanent evidence of the damage that inflammation and tension are capable of effecting in an organ which, relatively to its secreting and investing structures, is not unlike the kidney. The late Mr. Henry Smith was the first to draw attention to the advantages that followed puncture or limited incision through the capsule in acute forms of orchitis. It was correctly alleged that not only was the pain of tension in a highly sensitive organ relieved, but structural damage averted. In fact, sterility, so far as this organ was concerned, was by this simple means rendered unlikely to occur. It is, however, to the ocular and digital examination of the kidney during life that I would attach most importance relative to the subject that is now before us. This is a proceeding which may be regarded as an outcome of the general use of anæsthetics and antiseptics for almost all surgical proceedings. Before these were introduced the living human kidney was only seen on rare occasions in connexion with abdominal wounds accidentally inflicted and when the organ involved was in a healthy state. Now the operating surgeon may be said to be familiar with its appearance and consistence in all states of disease and injury. From my earliest explorations of the kidney I soon learnt to recognise that both in regard to its colour and consistence, apart from its size, there were very important variations to be observed which I had never seen in the organ after death. Later I observed that in some cases of albuminuria the albumin permanently disappeared from the urine after the kidney had been opened and permitted to drain, and thus the excretion became normal.

[Here Mr. Harrison narrated six cases in illustration of his points. The first was a case of scarlatinal nephritis, the second one of nephritis from exposure to cold and damp, the third one of subacute nephritis probably following upon influenza, and the fourth one of nephritis further complicated with an injury; all four cases were characterised by the presence of albumin in the urine, which he was inclined to attribute to inflammation or its immediate effects. The fifth and sixth cases represented other phases of renal tension. In reference to the second point, how they were to

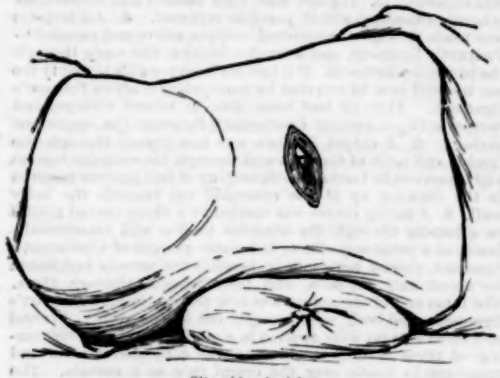
arrive at a conclusion as to the class of cases to which direct surgical intervention for the relief of tension may be applicable, he said:]

I can best put the case before you by taking types representing three states of acute nephritis which not uncommonly come under notice in connexion with scarlet fever. The first is the common type where there are varying degrees of fever, rash, and desquamation, with nephritis indicated by blood in the urine, albumin, casts, and epithelium. Cases included in this large class certainly do not require surgical attention, for recovery is steadily progressive, and after a few weeks' interval of illness and convalescence the congested organs return to their normal condition. The second group of cases, though apparently belonging at the commencement of the attack to the preceding class, does not end in the same way. The previously healthy adult or child passes through the early stage of the disorder much as in the former instance, but convalescence is delayed, and the signs of the nephritis, as evidenced by albuminuria and casts in the urine, do not disappear. The disease does not progress towards recovery, but is stationary and trends in the opposite direction. These are the instances which furnish a considerable proportion of the cases of chronic nephritis or Bright's disease, and a more or less invalid life is the prospect. It is to this class and the following that the relief of tension by a surgical proceeding may be said to be applicable. My third illustration is taken from what has been described as the malignant type of scarlatinal nephritis. Here the kidneys appear to be at once overwhelmed in the pathological changes that supervene, suppression of urine occurs, and death rapidly follows from uræmia, with coma and convulsions. After death under these circumstances it is usual to find the kidney intensely congested, and the capsule tense and shiny and over-filled with blood.

[Mr. Harrison then discussed the influence of the general tension thrown on the heart or circulatory apparatus in connexion with renal inflammation and concluded by considering the method of giving relief to renal tension under the conditions referred to. He said:]

The patient being anæsthetised and placed in the position for a lumbar nephrotomy, the kidney is exposed by a transverse incision through the loin about parallel with, and a little lower than, the last rib (Fig. 1). The length of the incision varies relatively to the consistence of the patient and the individual connexions of the kidney to be searched. In spare subjects an incision of three inches probably suffices. The various musculo-fascial layers are divided until the suprarenal fat is seen. The connective tissue covering this should be opened up with

FIG. 1.



Site of the incision.

probe and forceps, when the kidney may be recognised, help being rendered by an assistant pushing up the organ in the direction of the operator. There is seldom much bleeding or even necessity for tying a vessel. If the organ has to be further explored, as, for instance, for a possible stone, the kidney may be withdrawn through the wound for more thorough examination with the finger. This, however, is not necessary where tension alone exists. Sufficient prominence for a limited incision through the capsule so as to relieve tension and secure drainage, or even to puncture the organ, as for reni-puncture, can be given by an assistant in the way already mentioned. In incising the capsule of the kidney for relieving tension I prefer doing so along the convex border. Occasionally the incision may be indicated to one side or other of the free border, as congestions and extravasations of blood are not necessarily evenly disposed throughout. Punctures may be made almost anywhere where the engorgement seems greatest, but it is as well to avoid the pelvis of the organ, either in the case of these or of incision. I have frequently seen, on puncturing the capsule for the purpose of exploring, blood spurt out in jets, as if projected under considerable contractile pressure and eager to escape. The desired object being effected, whether it is limited to the partial division of the tense capsule or the more thorough exploration of the organ, as for stone, a drainage-tube is carefully inserted so as to remain in contact with the kidney, and the wound is closed round the rubber outlet with silk sutures (Fig. 2). The incision

FIG. 2.

Shows the wound closed.

is dressed with gauze antiseptically. As drainage is an essential part of the process, and may be continued for some days, or even weeks, before the tube is removed, an ample supply of absorbent dressings should be used and renewed as often as necessary. The drainage-tube usually remains *in situ* from a week to 10 days, but this entirely depends upon the nature and degree of the sanguineo-urinary discharge, which is sometimes profuse and continuous. On the removal of the drainage-tube the wound usually heals rapidly. I have never seen a permanent urinary fistula follow this proceeding. The question in a case of nephritis sometimes arises as to which organ should be selected for exploration. Unless there is something to indicate it, such as the presence of pain, my experience would lead me to believe that this is not a matter of much importance. Both organs are usually involved in the inflammatory condition, though perhaps it may turn out not to the same degree. In double nephritis the relief of tension in one organ aids the other, and thus, as I have noticed on several occasions, the normal amount and constitution of the urine becomes re-established. Similarly, aid to an injured kidney by the removal of direct pressure caused by the accidental extravasation of blood, either within or around it, has been shown to assist the opposite one, and to restore the balance of the urinary excretion when this has been diminished or entirely suppressed.

In this statement I have endeavoured to give prominence to those points which seem most deserving of consideration, relying more upon direct testimony than upon inferences drawn from lines of practice which can hardly be said to cover all varieties of this disordered condition. Nor have I made any attempt to elaborate my argument at this stage from such sidelights as chemistry, physics, or physiology might furnish, but have confined myself chiefly to that which is clinical. Propositions involving changes in well-worn pathologies and practices must be approached with deliberation and no one is more conscious of this than myself. "How far," to use the words of a recent writer, "the operation of incision of the kidney can prevent or relieve the effects of congestion time alone can show, but the subject deserves the careful attention of all surgeons."[1] I think

[1] Puncture of the Kidney for Nephritis, THE LANCET June 15th, 1901, p. 1688.

enough has been said to show this. I thank you for your presence, and commend this subject to your candid consideration.

Mr. W. D. SPANTON (Hanley) heartily endorsed the observations of the President. He had found free cutting of the loins alone of considerable use in such cases, and had operated on the organ itself in two cases of nephritis, one from exposure to cold and the other from injury, with good results. He considered the risks of this measure practically *nil*.

Dr. J. WARD COUSINS (Portsmouth), said that he had obtained good results in the reduction of renal tension by free purging with the dry-air bath. In selected cases he thought the operative treatment good. What he would require was a history previously good with a freedom from earlier renal damage; if this was known to have occurred he thought surgical interference valueless. He believed such measures were admirably adapted for the treatment of the so-called "uræmic convulsions" of alcoholic excesses, provided there was a good previous history. He feared that the treatment was likely to be of no use where there was a sudden suppression of urine in cases of chronic renal disease with heart affection.

Mr. G. BARLING (Leeds) suggested that in some of these cases the success of the operation might lie in the fixation of a previously loose kidney, owing to a consolidation of the perinephric tissue produced by the handling of the organ. He believed that relief of tension could be afforded by the operation, but he instanced a case of very severe congestion following on catheterisation where he could not hope for relief by such means; the extreme condition of vascular engorgement and extra-vascular extravasation would not allow of it. In such cases they must rely on medical means and wet cupping. In cases of marked hæmaturia where the affected kidney was detected by the cystoscope, bisection of the organ in the anticipation of malignant growth elicited no explanation for the bleeding; the organ was therefore sutured and returned with the result that for three years there had been no recurrence of the symptoms.

Mr. R. C. CHICKEN (Nottingham) controverted the usefulness of the operation on the grounds (1) that hæmorrhage in the kidney resulted in minute clots which were not removeable by any incision; (2) that it had been shown by the work of Moxon and of Johnson that the vascular supply of the kidney was very distinctly in connexion with that of the dorsal parietes, so that any good effect of kidney incision could be equally well produced by skin or lumbar incisions. Further, he had in a case of scanty bloody urine obtained complete cessation of the symptoms by repeated washing of the bladder.

Sir WILLIAM MAC CORMAC (London) proposed a vote of thanks to the President for the admirable paper with which he had opened a discussion of much interest.

Mr. J. HUTCHINSON, jun. (London), read a paper on

Operative Treatment of Renal Calculus.

He pointed out that the skilled use of the Roentgen rays has improved the treatment of this disease in many ways: (1) by affording precise indications for operation; (2) by showing the size, number, and exact position of the stones; (3) by making the operation simpler, more speedy, and safer than before; and (4) by revealing in some cases the presence of unsuspected stones in the opposite kidney, or proving that the pain had been misleading as to the site affected. The objections formerly raised to the use of the x rays were now practically removed. The photograph could be produced with such rapidity that the mobility of the kidney with respiration could be neglected: the best of his photographs had been produced by a 15-second exposure. He believed that the use of this means of diagnosis would abolish the custom of dragging out the kidney into the loin and the splitting of the cortex in search of stones, and further that there was less risk of overlooking one of many stones. He showed the safety of opening the pelvis of the ureter and removing stones directly therefrom, rather than indirectly through the cortex. He thought that in all cases where even small stones were seen to be present operation was indicated; their presence was a danger to the kidney and so to the life of the subject.

Mr. J. R. MORISON (Newcastle-on-Tyne) cited a case where the symptoms were almost undoubtedly those of stone. Mr. Mackenzie Davidson could find no signs of calculus with the x rays. He (Mr. Morison) noted that when a stone was indicated by the shadow it might be held with certainty to be there, but an absence of shadow did not afford a negative certitude. He agreed that incision through the pelvis of the ureter was both preferable and safe. If the ureter was patent there was no risk of fistula.

The PRESIDENT repeated a question which he had put in THE LANCET of February last as to the possibility of affecting the depth of the shadow of a stone produced by x rays by the colouring of the stone by the exhibition of drugs. He had seen stones deeply stained by the use of methylene blue for cystitis.

Mr. N. BISHOP HARMAN (London) said that the experience of physicists was that the depth of the shadows obtained by the use of x-rays depended upon the chemical density only of the object interposed between the kathode and the sensitive plate. The heavy and dense metals and metallic salts were impermeable to the rays, whilst materials of lesser density, irrespectively of their colour, were to a greater or less degree permeable. It was not possible to affect the density of calculi by their colouration by the usual dyes; if they could be impregnated with heavy metal salts this could be done, but he doubted its possibility or utility in the human body.

Dr. H. BRAMWELL (Cheltenham) read a paper on

A Case of Moveable Kidney producing Stenosis and Constriction of the Duodenum by Peritoneal Bands.

The case supported his contention that a simple acquired moveable kidney was not a condition of slight importance, and that contrary to the case of floating kidney, where the organ formed for itself a channel under the peritoneum which allowed it to move without damage to the hollow abdominal viscera, the form of moveable kidney described carried with it its peritoneal covering, with the result that there was considerable dragging on the adjoining hollow viscera. The thickened bands thus produced were capable of seriously affecting neighbouring hollow organs, producing stricture of parts with consecutive dilatation of others. In this case spasm and stenosis of the pylorus produced fatal gastric dilatation with atrophy of the muscular coats of the viscus.

Femoral Hernia.

Mr. R. H. PARRY (Glasgow) described a means of closing the crural canal from above, in place of the older method of closure from below, with which he had obtained excellent results. He maintained that by it there was left no cup-shaped remnant of the crural canal and the liability of damage to the femoral vein was excluded. The procedure might be summed up as follows:—1. A curved incision over the inner end of Poupart's ligament convex downwards, the flap was turned up and the region cleared until (2) Poupart's ligament was exposed. 3. The sac was then cleared and opened, its contents examined and if possible replaced. 4. An incision was made through the external oblique above and parallel to Poupart's ligament, and a similar division was made through the transversalis fascia. If it had not been possible to empty the sac it could now be emptied by manipulation above Poupart's ligament. Thus he had been able to relieve strangulated herniæ without cutting Gimbernat's ligament (an important saving). 5. A catgut ligature was now passed through the fundus and neck of the sack and through the conjoint tendon and transversalis fascia; the tightening of this ligature resulted in the drawing up of the crumpled sac beneath the belly wall. 6. A strong suture was carried by a sharp curved needle on a handle through the conjoint tendon and transversalis fascia at a point opposite to the outer margin of Gimbernat's ligament, passed horizontally beneath the muscle and fascia for about half an inch, and then brought through them. The inner end of the suture was now passed through Poupart's ligament, and both were brought out in the groin. Second and third sutures were applied in a similar way. The tightening of these sutures would draw the conjoined tendon and transversalis fascia over the crural ring as a curtain. The sutures could be tied so as to avoid pressure on the vein. The final stages were in the usual way.

Mr. JORDAN LLOYD (Birmingham), deprecated the introduction of special and highly technical methods into these operations; further, he preferred to see the sac cut off, and silk ligatures used on.

Mr. MCADAM ECCLES (London) also agreed to the advisability of removing the sac or using silk sutures. He thought that the closing of the canal from above Poupart's ligament was to be preferred to closing it below, since he believed there was a lessened liability to recurrence.

Mr. W. H. BROWN (Leeds) read a paper on

The Prevention of Shock during Prolonged Operations.

He dwelt particularly upon those cases where operative relief was sought by the patient in the last stages of exhaustion, where the strength was so enfeebled that there was little or no hope of the shock of an otherwise useful operation being withstood. In such cases he had found that marked benefit might be derived by the transfusion of quantities of saline solution to five pints or so; this addition of fluid to the circulation so far restored the patient that the operation could be proceeded with with reasonable hope of success; the blood lost was not so much missed, and in some cases there was found a better pulse after a severe operation when performed under these conditions than at the beginning.

Mr. T. R. JESSOP (Leeds) said that he was satisfied as to the utility of the procedure, particularly if combined with the hypodermic injection of strychnine.

OBSTETRICS AND GYNÆCOLOGY.

WEDNESDAY, JULY 31ST.

The Presidential Address.

Dr. J. W. BYERS, Professor of Midwifery and Gynæcology, Queen's College, Belfast, delivered an address at the opening of the section upon

Puerperal Fever, Uterine Cancer, and the Falling Birth-rate.

He said: In 1847–56 the mortality from puerperal fever in England and Wales was 1·8 per 1000. It rose to 2·28 in 1875–84, and to 2·46 in 1886–95. The following figures (which I owe to the kindness of Dr. R. Boxall, who has taken such an interest in this question) give the most recent available statistics:

Year.	Deaths from puerperal fever.	Death-rate from puerperal fever per 1000 births.
1895	1849	2·0
1896	2053	2·2
1897	1836	1·9
1898	1707	1·8
1899	1908	2·0

Dr. John Tatham, Statistical Superintendent, General Register Office, has kindly supplied me with the following most interesting details:

Deaths of Women at all Ages from Puerperal Fever and other Accidents of Childbirth per 1000 Registered Births in England and Wales:—

1871–80	4·72
1881–90	4·73
1891–99	5·12

The following return showing the number of deaths in Ireland tabulated under Parturition (accidents) and Puerperal Fever I owe to the courtesy of Mr. R. E. Matheson, Registrar-General of Ireland:—

Years.	Total.	Death-rate per 1000 births registered.
1895	769	7·2
1896	679	6·3
1897	606	6·5
1898	560	5·3
1899	601	5·8

For the same years the deaths from puerperal fever for the whole of Ireland were:—

Year.	Rate per 1000 births.
1895	3·0
1896	2·3
1897	2·1
1898	1·7
1899	2·0

I am obliged to the Registrar-General of Scotland for giving me the following

Table Showing the Death-rate from Puerperal Fever in Scotland during the Five Years, 1895–1899.

Year.	Number of deaths.	Proportion in every 100,000 of female population.	Proportion in every 10,000 specified causes of death.
1895	253	12	62
1896	220	9	63
1897	205	9	52
1898	227	10	59
1899	214	10	54

We may contrast these lamentable statistics with the following returns for the last two years of the practice of the Rotunda Hospital, the largest lying-in charity in the three kingdoms:

Mortality at the Rotunda Hospital for the Years 1898–99 and 1899–1900.

—	1898-99.	1899-1900.
Intern maternity:		
Total cases	1591	1560
Total mortality	10	6
Percentage mortality	0·62	0·38
Mortality from sepsis (two of these admitted septic)	5	0
Extern maternity:		
Total cases	2163	2109
Total mortality	8	5
Percentage mortality	0·36	0·23
Mortality from sepsis	2	0
Total cases	3754	3669
Total percentage	0·47	0·27

For two years the total was 7423, and the percentage was 0·39.

These figures should make those of us who are teachers feel how great is our responsibility, and that our efforts should be redoubled in urging upon students the importance of regarding the process of labour as a natural one and not to be lightly interfered with unless nature herself should fail, and that if interference becomes necessary they should use exactly the same antiseptic precautions that they see employed in any gynæcological operation. It is by the observation of these two principles—the avoidance of meddlesome interference and by the rigid use of antiseptic principles—that we may hope that in the present century the occurrence of puerperal fever will eventually be as rare in private practice as it became in the nineteenth century in lying-in hospitals. The other subject in regard to which, I am afraid, we cannot congratulate ourselves is cancer of the uterus. How does it originate? Why is it so common? Nay, more, why (at least this is my experience) is it becoming more prevalent? These questions surely demand solution. I am reluctantly forced to agree with a statement made by a distinguished American *confrère*, Dr. Baldy, in a paper read before the Section of Gynæcology, College of Physicians of Philadelphia, Feb. 21st, 1901: "Cancer affecting the cervix uteri is one of the most deadly diseases with which medical men have to deal. By far the largest proportion of these patients eventually die of cancer, be it from the primary lesion or from a recurrence. And this in spite of all that has been done for them either surgically or medically." No doubt some gynæcologists may say the explanation is that operation is not done early enough, but, as Dr. Baldy fairly asks, "What is sufficiently early?" Every gynæcologist of experience must admit that he or she has met with cases where recurrence took place rapidly in what seemed to be at the time of operation a most promising condition, while, again, women with extensive disease have remained well for years after operation. We have passed through the stages of vaginal and of abdominal hysterectomy for cancer of the cervix, but I ask, have we up to the present made much real progress? It is not the immediate results of the operation we want to know, it is the subsequent history of the patients. At the present time we can, unfortunately, suggest no other

plan of treatment of cancer of the cervix except by operation, but surely we cannot boast much if the statement of Baldy is correct that the most recent statistics, those reported in Cullen's work on Cancer and the review of cases by Winter of Königsberg, show that in reality less than 5 per cent. of all patients applying for treatment of cancer of the uterus are saved by operation. The obvious lesson is that to ensure any real success we must urge on practitioners the enormous importance of early diagnosis, and that the one symptom which should always be regarded with suspicion is abnormal hæmorrhage. Any woman with abnormal hæmorrhage at any age, and especially if she is over 35 years, demands the most careful clinical examination. Let us hope for greater progress in the future.

Having glanced in what, I am afraid, is a very cursory survey at the progress of these subjects which specially concern us, let me turn to another question of the greatest interest to the State as well as to the medical profession. During the present year the public press has been calling special attention to the falling birth-rate. It would appear that in England and Wales in 1861-71 the birth-rate per 1000 was 34·8. In 1871-81 it was 34·7; in 1891 it was 31·4 per 1000; and since then it has steadily gone down until in the last year of the century, 1900, it was only 29 per 1000. In 1875 35 children were born in the United Kingdom for each 1000 of the population, while in 1900 there were only 29. In other words this means that for our population of 41,500,000 we are losing 249,000 children annually, and the birth-rate has fallen by 2·67 in the last 10 years. The actual increase of the population of England and Wales is due to the fall in the death-rate and the increase of immigration. We are thus rapidly in England approaching the condition prevailing for some time in France and America. It is not for me at present to discuss the causes of this declining birth-rate; rather my duty is to ask what remedy can we as medical men suggest to combat a state of matters which, from a national and imperial standpoint, must be regarded as most unsatisfactory. If fewer children are in the future to be born in this country, we must redouble our efforts to lower the high death-rate of infants, which during the first year of life amounts in England to 154 per 1000, by teaching the people to pay much greater attention to rearing their children properly.

Professor Byers concluded by impressing upon his audience the absolute necessity of examining patients expecting their first confinement as strictly and exhaustively as though for life assurance. He urged the importance of instructing impending mothers on all questions of diet and exercise, and deplored the fact that in Great Britain no enterprise was shown in the matter of supplying sterilised milk for infants.

The Causation, Prevention, and Treatment of Miscarriage.

A discussion on this subject was opened by Dr. PETER HORROCKS, President of the Obstetrical Society of London. The causation of miscarriage was classified as follows:—*A. Damage to the normal attachment between maternal and fœtal parts.*—(*a*) Accidental, such as injuries from hard work (lifting, strains, running and jumping), falling, blows, coitus, shock, fright, vomiting, coughing; surgical interference, such as operations about the vagina, cervix uteri, ovaries, and abdominal sections generally; passing instruments into the uterus, such as the uterine sound or dilators; and vaginal douching. (*b*) Criminal, by the passage of a sound, bougie, curette, sharp instrument to rupture the membranes, tents, injection of fluid into the vagina or uterus, dilatation of the os uteri, application of caustics to the os uteri and within the canal of the cervix; packing the vagina, dilating and trying to set up reflex action in the uterus; drugs, such as purges (especially aloes), savin, ergot, lead, mercury, arsenic, carbonic oxide, and carbonic dioxide as in asphyxia; and violence, such as jumping, dancing, riding, rowing, falling, blows, and tight bandaging of the abdomen. (*c*) Disease neighbouring parts, such as fibroids, parametritis, perimetritis, tubal diseases, ovarian diseases, tumours or blood-clots in the pelvis, contracted pelvis, tumours in the abdomen, tight lacing, and rectal diseases. (*d*) Artificial, when abortion is scientifically induced by means of bags, such as Barnes's, De Ribes's, Horrocks's; sound, dilators, bougie, tents, sharp instruments rupturing membranes, curette; drugs, such as ergot, digitalis, savin, cantharides, quinine, gossypium, lead, aloes, purgatives; and douching, dilatation of the cervix uteri, and dilatation of the vagina. *B. Fatal pathological conditions.*—Syphilis, malformation causing death of the fœtus (spina bifida, &c.), twisting of cord round the neck, too short a cord, fœtal hæmorrhage into the placenta, carneous mole, hydatid mole, fatty degeneration, excessive or scanty liquor amnii, deciduoma maglignum, low vitality, imperfect fertility from debauchery or feebleness, extreme youth or age of either parent (especially father), inflammation, œdema or tumours of the placenta; diseases of the chorion, amnion kidney, liver, genitals; and rupture of the membranes. *C. Maternal diseases, general or local.*—Fibromyomata, displacements (especially retroversion and retroflexion), syphilitic endometritis, maternal hæmorrhage into the placenta, carneous mole, diseases of heart, lungs, liver, kidneys—eclampsia; chorea, epilepsy, blood diseases, jaundice (acute yellow atrophy), placenta prævia; zymotic diseases, especially small-pox, scarlatina, and typhoid fever, which destroy the fœtus by toxæmia, pyrexia, or hæmorrhage into the placenta; hydrorrhœa gravidarum, catarrhal endometritis, oversuckling, habit (menstrual nisus), cancer, apoplexy; fissure of cervix, deep lacerations, patency of canal, paralysis of lower zone of uterus, pyrexia, damage to the uterus from anything causing it to contract; and alcohol, anæsthetics, hot sitz-baths, and tooth extraction. The things to be *avoided* were riding, dancing, cycling, golf, tennis, falls, blows, coitus, lifting, walking too far, standing too long, shocks, frights, dogs, operations, tight-lacing, constipation, purgation, ecbolic drugs, over-lactation, alcohol, hot sitz-baths, overheated rooms, bad ventilation, emotional excitement, and late hours. The things to be *corrected* were obstructions, inflammations, displacements, unsuitable diet, dyspepsia, flatulence and colic. The conditions to be *treated* were syphilis, bad health, weakness, fits, cough, zymotic diseases, laceration of the cervix, and pyrexia. The treatment of miscarriage was considered under three heads, according as the miscarriage was (*a*) avoidable, in which case the leading features of treatment were rest, opiates, or other sedatives, ergot, or other ecbolics—when in doubt, treat as in (*b*)—(*b*) unavoidable (here the miscarriage should be assisted by means of tampons or gauze packing, rupture of the membranes, and the clearing out of the uterine contents), or (*c*) incomplete (here delivery should be completed by the use of tampons or packing or by clearing out the uterus completely).

Dr. AUST LAWRENCE (Bristol), said that proper treatment depended on correct diagnosis and a very important point was the diagnosis between threatened abortion and extra-uterine pregnancy. Broadly, he laid down the dictum that much hæmorrhage and little pain pointed to intra-uterine miscarriage, whilst scanty hæmorrhage with much pain pointed to the extra-uterine pregnancy. When miscarriage was inevitable the sooner the uterus was emptied the better. In hospital this should be done deliberately under an anæsthetic; in private practice it was often better in the first instance to pack the cervix and vagina with iodoform gauze. He deprecated the use of the curette, considering that the finger was sufficient. Complete dilatation of the cervix was of the utmost importance, inasmuch as when septicæmia followed it was nearly always the result of incomplete dilatation.

Dr. A. J. SMITH (Dublin) described cases of threatened abortion that needed no interference, as those with slight pain, slight hæmorrhage and no dilatation of the os. Those requiring interference were those with much pain, dilatation of the cervix and protrusion of the ovum. The best drugs in the prevention of miscarriage were cannabis indica and opium. He did not approve of ergot, because he believed that if enough were given to arrest hæmorrhage it would itself induce abortion. If inevitable the ovum should be separated with the finger; to remove the ovum a good practice consisted in removing the finger and seizing the uterus bimanually, when the ovum would be found to shoot out. It was sometimes a matter of difficulty and yet of importance to determine whether or not the ovum had actually been expelled. In this connexion it was useful to note that before expulsion the internal os was generally open and the external os closed; whilst after expulsion the internal os was closed and the external os open.

Mr. HAWKINS-AMBLER (Liverpool) referred to the treatment of constipation, which was often a very difficult matter in these cases, as too much purgation might lead to the result which they wished to avoid. Packing with gauze was useful after clearing out the uterus, because membranous shreds, &c., might be retained and the gauze helped to bring them away.

Dr. J. A. LYCETT (Wolverhampton) insisted on the part played by excess of alcohol, not only in inducing abortion, but also in causing deterioration in the health of a child who survived. With regard to portions of placenta left behind, he thought that a medical man was not necessarily to blame if this occurred, but he would be to blame if he overlooked hæmorrhage resulting therefrom. Dr. Lycett showed an ingenious instrument for dilating the cervix.

Dr. WILLIAM DUNCAN (London) referred to retroversion of the gravid uterus as a cause of abortion; in some cases the reposition of the uterus and insertion of a well-fitting Hodge failed to avert the miscarriage. He spoke also of the tendency to abortion in cases of heart disease. In one case of this kind he kept the patient absolutely in bed and ordered daily massage, with the result that she went on to full time. In treatment where there was hæmorrhage without pain he gave ergot in from five to 10 minim doses every hour; opium might be given at the same time if necessary. If there were pain as well as hæmorrhage he did not give ergot. In cases of unavoidable hæmorrhage he advocated the complete clearing out of the uterus combined with curetting of the endometrium under anæsthesia. He used a flushing curette with perchloride in the strength of 1 in 2000. In some hundreds of cases in which he had adopted this treatment he had never had either hæmorrhage or rise of temperature following the operation.

Dr. INGLIS PARSONS (London) expressed his belief that a woman who was fairly healthy and sound could do almost anything in the way of exercise or travelling without fear of aborting. Among antiseptics for use in cases of surgical interference he specially recommended the use of chinosol. An excellent sedative in cases of threatened, but not inevitable, abortion, was viburnum primifolium.

Mrs. STANLEY BOYD (London) remarked that in packing with iodoform gauze it was often sufficient to pack the vagina. Packing of the cervix was in many cases difficult and it was important to avoid all fissures and punctures of the cervix whereby sepsis might be favoured. For this cause she thought it best to avoid the use of the volsella when the cervix had to be packed.

Dr. F. W. N. HAULTAIN (Edinburgh) dwelt on the importance of full dilatation of the cervix before any attempt was made to extract the fœtus; sometimes the body of the fœtus was drawn through and the head left behind because the orifice was too narrow. If the dilatation was insufficient it was better to pack the cervix with gauze and to wait.

The PRESIDENT remarked that the syphilitic factor was an important one, although the part it played had, perhaps, been overstated by continental writers, who attributed to this cause 60 per cent. of abortions. Repeated abortions were specially apt to be due to this cause. Treatment should be given to both parents.

Dr. HORROCKS briefly replied.

Deciduoma Malignum.

Dr. PETER HORROCKS read the notes of a case of this kind and showed the specimen, together with microscopic sections. The patient thought that she had miscarried and was losing much blood. Examination revealed a growth and hysterectomy was performed. The patient made a good recovery from the operation but died some two months later from secondary deposits. Unfortunately no necropsy was allowed.

Cæsarean Section with Notes of Three Successful Cases.

Dr. MUNRO KERR (Glasgow), in his paper, pointed out that the operation had been performed in the Glasgow Maternity Hospital between 60 and 70 times since April, 1888; and that in the cases that had proved fatal, with two or three exceptions, the cause of death had been septicæmia; further, that in the majority of cases the infection was through the vagina and cervix, and not through the abdominal wound. He therefore laid great stress on the preparatory cleansing of the vagina by thorough cleansing with lysol. He did not draw out the unopened uterus through the abdominal wound. The opening in the uterus was in every case longitudinal and in the middle line, the bleeding in cutting through the wall being controlled by the vulcanite ring recommended by Cameron. After extraction of the child the uterus was firmly grasped by the assistant to control bleeding; elastic tubing was not used for this purpose. The conservative operation was done in each case, the uterus being left, but the patients were sterilised by tying the Fallopian tubes in two places and dividing between the ligatures. In each case labour was in progress, and in two had advanced considerably before the operation was commenced. After giving the notes of three cases Dr. Kerr remarked that the safety with which Cæsarean section could now be performed was such that in cases of pelvic deformity they were now hardly ever justified in destroying a living child by craniotomy. The only circumstances where such operations were permissible were where fruitless attempts had been made to extract the child with forceps or version, from ignorance or miscalculation of the extent of the pelvic deformity; where the mother's condition was such as to preclude abdominal section; and where the child was the subject of hydrocephalus or some other extreme malformation or was dying. That the pregnancy was illegitimate could not be considered as affecting the indications of the operation. With such a circumstance they dare not concern themselves. Dr. Kerr did not consider that there were valid grounds for preferring supravaginal amputation to the conservative operation. Nor did he endorse the transverse fundal incision recommended by Fritsch. It was, however, important that the longitudinal incision should not be carried too low. In all the cases the placenta was situated on the posterior wall of the uterus and separated immediately after the birth of the child.

In the discussion on this paper Dr. PURSLOW (Birmingham) remarked that he considered it an advantage to make a longer incision and to draw the whole uterus out of the wound before opening it.

Dr. WILLIAM DUNCAN advocated the operation of removal of the uterus. In all his cases he had found the placenta situated in front.

Mrs. SCHARLIEB (London) said that in the cases which she had seen the placenta was always behind. She had employed the straightened-out Hodge recommended by Cameron; but it was of little use except when the child was lying with the back anteriorly, for otherwise no pressure could be exerted.

After some observations by Dr. HORROCKS, Dr. MUNRO KERR replied.

Mr. HAWKINS-AMBLER read a paper on Shock in Abdominal Operations, and Dr. WILLIAM DUNCAN expressed regret that the lateness of the hour precluded a proper discussion of this admirable paper.

STATE MEDICINE.

WEDNESDAY, JULY 31ST.

The Presidential address.

The PRESIDENT (Mr. Shirley Murphy, London), after referring to progress in sanitary matters, said that each addition to knowledge necessitated better opportunities of observation and fuller investigation in the laboratory. There was need of a more complete system if the Notification Act was to be fully utilised. Valuable material already existed for the study of the behaviour of infectious diseases and there should be some classification on a uniform principle. It was hoped that the time was not far distant when it would be possible to take stock of industrial diseases.

The Relation Between County and District Sanitary Administrations.

Dr. F. T. BOND (Gloucester) opened the discussion on this subject. He said that any form of sanitary administration without a medical officer of health was, to use a well-worn simile, like the play of *Hamlet* with the *rôle* of the Prince of Denmark omitted. Where the appointments of sanitary inspectors were filled by thoroughly competent men a single medical officer of health could superintend efficiently a far larger district than was possible where he was unable to depend on his inspectors. County councils should have the same freedom of combination with one another that was possessed by the district councils. The Public Health Act allowed district councils within or without the same county to combine for various purposes, including the appointment of a medical officer of health, and the same power should be given to counties. Dr. Bond then proceeded to discuss whether it was expedient as a general principle that the medical officer of a county council should hold at the same time any appointment under a district council in that county. In his opinion, the work required the intelligence and experience of a trained expert, and whether that expert held the position of a county medical officer or of an officer to a combination or to a single district was not of the least importance. What was of importance was that he should be competent for the

work, and the objection to a district medical officer reporting on his own annual report as a county official was founded on an erroneous view of the work involved. Wherever combined districts existed in any counties they should be utilised as the basis on which they could most conveniently and economically erect a well-adjusted county sanitary administration. Amongst the duties which would ere long probably be imposed on sanitary authorities would be the superintendence of vaccination and this would at once make it imperative that every county council should appoint a medical officer of health. The plea that it was of no use for these councils to make such an appointment until they were invested with fuller sanitary powers was met by the reply that county councils could hardly expect that their sanitary powers should be enlarged until they showed that they had made an effort to use those with which they were already invested.

After some remarks by Mr. G. H. FOSBROKE (Worcester),

Dr. J. LLOYD ROBERTS (Colwyn Bay), said that in North Wales there was but one county and in South Wales there was but one that had officers of health. Many English counties were in the same position. It was unnecessary to enlarge upon the great losses to the public health entailed by the failure of these many counties to establish committees and officers who would be the connecting links between the county and the local administrations. Many localities could be called to mind as being as insanitary at the present time as they were when the Public Health Act came into operation in 1875. There were localities in which sewerage and water-supply schemes had been propounded for more than 20 years which were as far from accomplishment now as ever they were. Where Local Government Board inquiries had been held on epidemics nothing had been done after the exciting cause had passed off. District councils were responsible for these omissions and shortcomings and the causes were fear of putting the parish to expense and personal dread of loss of popularity and consequent loss of a seat on the council. The Local Government Board spasmodically and at long intervals wrote to a district council to ask what action was being taken upon a certain matter and they seemed to be contented with receiving a courteous but evasive reply. District councils escaped taking responsible action by sheltering themselves behind the Local Government (Parish Councils) Act 1894, which required notice to be given of sanitary proposals to the parish councils concerned. Parish councils based their ideas of public health requirements upon finance rather than upon necessity. A scheme for sewerage or for water-supply had to go through a parish council not for approval but for information and then to the Local Government Board for approval and permission to raise a loan. In the matter of finance there was no such want of uniformity. Government auditors looked properly after the accounts and over each and every authority and the various members thereof there was always the fear of this official auditorship overhanging, lest by any mistake or mischance a surcharge should be made upon the individual who wrongly signed a cheque. It was clear that, as in the case of the Infectious Diseases (Notification Act) which had been made compulsory everywhere, all county councils that had not appointed medical officers of health should be called upon to make such appointments, and county councils might be endowed with the powers of the Local Government Board. In this manner county and district sanitary administrations could be brought into relation.

Municipal and County Laboratory Work.

In his absence a paper by Dr. E. C. SEATON (London) was read by one of the secretaries. Dr. Seaton's opinion was that laboratory work entered more than ever into the daily routine of the public health and sanitary departments of most municipalities. After a full retrospect of the facts of the case the scope of sanitary analyses was next dealt with in the paper. In every large town there was a demand for bacteriological examinations for diagnostic purposes in aid of the general practitioner and also for hospital purposes which might be provided at a central bureau connected with the municipal offices. The first object of the sanitary authority should be to repress injury to health and not to allow this to become subordinated, as it had been for some time past, to the detection of a certain kind of commercial fraud. The concentration of laboratory work was then discussed by Dr. Seaton, who gave details of the county laboratory of Worcestershire, where the analytical chemist, Dr. Duncan, conducted the diagnostic examinations for diphtheria, empyema fluid, tubercle, &c.

Mr. HENRY MAY (late medical officer of health of Aston Manor) considered that no injustice was done by a county medical officer of health being also district medical officer of health.

Mr. T. W. H. GARSTANG (Bowdon, Cheshire) advocated "security of tenure" for medical officers of health. He thought that weekly notification of infectious diseases was a matter dependent on local conditions.

Dr. E. J. SLADE-KING (Ilfracombe) said that Parliament should make weekly returns absolutely compulsory. If parish medical men were life officers it was much more important that medical officers should be.

At this stage of the discussion Dr. J. GROVES (Carisbrooke, Isle of Wight) moved, Dr. SLADE-KING seconded, and Mr. HERBERT JONES (Hereford) supported, the following proposition, which was carried later in the proceedings:—

That having regard to the paramount importance to the interests of the public health of security of tenure of office of sanitary officers the State Medicine Section beg to express their approval of the action of the council in promoting a Bill in Parliament to that end and their thanks for the same.

Alderman WALTER SMITH (London) [advocated] that bacteriological examinations should be undertaken by sanitary authorities for medical men gratuitously.

Dr. A. K. CHALMERS (Glasgow) said that in his district the bacteriological work was done gratuitously with satisfactory results.

The PRESIDENT believed that the ultimate solution of the problem of the relations between the county and district medical officers of health would be found in the appointment of both by the county council.

Dr. BOND, in winding up the discussion, said that it was desirable to have as much elasticity as possible in this matter and that the requirements of efficiency should not impose undue pressure on county finances.

Dr. D. S. DAVIES (Bristol) read a paper on

Plague and its Prevention as a Disease Communicable from Animal to Man

and at the conclusion he made the following motion which was seconded and carried:—

That this meeting considers the time has come when the question of dealing with ship-brought plague deserves the attention of the Government, with the view of securing an international agreement whereby merchant vessels shall take the necessary steps for the destruction of rats on board before loading and upon discharge, and, in addition, for the adoption of uniform steps to prevent intercommunication during loading and discharging between ship and shore rats.

PSYCHOLOGICAL MEDICINE.

WEDNESDAY, JULY 31ST.

The Presidential Address.

Dr. J. B. SPENCE, resident physician and superintendent, Staffordshire County Asylum, Burntwood, delivered the following introductory remarks at the opening of the section:—

Asylum Administration and Nursing.

Dr. Mercier, in his well-known crisp and incisive manner, has in the last number of the *British Medical Journal* for 1900 given a brief, instructive, and interesting account of the position of affairs in the lunacy world at the commencement of the last century, and it would well repay the labour involved and the time occupied if one had the opportunity to enumerate in detail the various discoveries, improvements, and legal enactments which have so advantageously changed the treatment of the mentally afflicted since that period. Not only, however, were the insane subject to very terrible and inhuman treatment at the commencement of the last century, but in many other directions also the condition of the people was practically in a state as unsatisfactory. Picture to yourselves the prisons of those days—the dens to which debtors were relegated, the condition of the poor in their own homes, the monstrosities practised in the name of justice, when men were sentenced to death, and not only sentenced but in some instances actually hanged, for offences which in these happier days would be considered as severely punished by a few months, or at the most years, of imprisonment in establishments which, when contrasted with the prisons of a century ago, may fairly be said to have made as great an advance as that which has taken place in our asylums or other public hospitals. For the marvellous progress that has marked the past century

and has rendered the Victorian era a golden one we should not rest content with being merely grateful, but should endeavour as far as lies in our power to maintain and promote all means which tend in the direction of useful progress, and so continue the great work which has made the names of Tuke, Conolly, the Browns (father and son), Bucknill, Maudsley, Clouston, and many others honoured and glorious in our specialty. I heard it said not long ago that there was a feeling abroad in favour of lay management of our large asylums. Well, to those of us who have lived long enough this is nothing new. Ideas occur in cycles, and what to the experienced is but the repetition of an oft-exploded theory comes to those who are new to the subject and who have not given it much consideration as something which, to put it at its lowest, merits at least a trial. It does appear to me that in few other positions is the combination of the medical man with the good organiser so necessary as at the head of an establishment in which the treatment of the inmates is not purely medical or purely reformatory or merely curative, but where many methods must be employed if ultimate success in dealing with the variety of types which come under our care is to be looked for. It is in this connexion that I regret the establishment of the huge asylums to which unhappily use is accustoming us. In the medium-sized asylum there is just that amount of work which any man who is worthy of his position should be able to supervise with due attention to the various departments into which the establishment must necessarily be divided, and where the one governing mind can so utilise the means of treatment placed at his disposal that whether the individual patient—known to the chief by name, by disposition, in his family relationships, in his special characteristics, and in his necessities—requires medical or moral treatment, the care of the sick-room or the exercise of the garden or farm, the quiet of the cosy ward or the stimulating effect of the workshop, each can be brought into play without the risk of producing that friction which practical experience has shown to be not infrequently present when more than one controlling influence is in operation. As a question of expense, I have yet to learn that the medium-sized asylum is more costly in its management than the large establishments which, while they excite the wonder of the inexperienced, produce only feelings of regret in the minds of those who have to govern them. Nor have I had it proved to me that better results have been produced either in the treatment of the insane individual himself with regard to the promotion of his recovery, the increase of his comfort when in fair bodily health, or his treatment when attacked by illness, physical or mental. The feeling of consternation that is abroad in connexion with the necessity for still further provision for the insane will have to be dealt with and one cannot resist the conviction that the time has come when some change in the classification of our patients might well be attempted. There is ample scope, I feel sure, for hospitals for the insane to which only paying patients at low rates should be admitted and there is a large class of demented lunatics and unteachable imbeciles in asylums for whom plain housing and plain dieting might well answer. There are also epileptics and imbeciles in workhouses who should no longer, or only for the short time that is required to provide other abodes for them, be detained in places which, on the showing of many speakers at a recent Poor-law conference, are quite unsuited for the care and treatment of such cases. I know full well that there is a strong feeling against the herding, as it is called, of a number of imbeciles and demented people together. I have heard not so long ago a very forcibly-expressed opinion that it would be an improper thing to remove the demented from our asylums, as the prospect of recovery should never be lost sight of even in the most apparently hopeless cases, but with all respect for the opinion of such a distinguished member of our specialty as Sir James Crichton Browne, I cannot think that for the sake of the very occasional case of recovery to which he referred in his admirable address to the Asylum Workers' Association we should be deterred from providing good and proper but comparatively inexpensive accommodation for the class of patients to which I allude. It is not my intention for one moment to suggest that the chronic dement in the counties should not receive the same amount of care that is given to the corresponding class for whom the Metropolitan Asylums Board is responsible. What I urge is that some such accommodation and treatment should be provided in the counties as are given in London, thus relieving the acute asylums and enabling them to carry out the work for which they should be, in my opinion, reserved. There is the difficulty for the small counties that an institution common to several would probably be required owing to the few cases each of these counties would have to provide for. It has been said also that even the individual lowest in the scale of mental degradation can appreciate the bright and comfortable surroundings of the average county asylum. But when all is urged that can be brought forward to support this side of the question, I shall still hold the opinion that while no expense should be spared to provide the necessary appliances and the most favourable environment for the curable, yet in a distinctly appreciable proportion of the incurably insane and the mentally deficient a kindly, judicious, and truly philanthropic system of treatment might be adopted without loss of benefit to the class in question and at a much reduced cost to the long-suffering ratepayer. As to the form in which accommodation should be provided for those suffering from mental disorders of a curable nature, I am delighted to think that the trend of educated opinion in this country is in favour of segregation, and we are all looking forward with interest to the result of the experiment which has been taken in hand by the East Sussex County Council and by the authorities whose duty it is to provide accommodation for the insane poor of Edinburgh and Aberdeen. Dr. Spence concluded by referring to the progressive work of the London County Council at the Claybury Pathological Laboratory and pleaded for the systematic education and training of asylum attendants.

Dr. W. FORD ROBERTSON (Edinburgh) opened a discussion upon

The Rôle of Toxic Action in the Pathogenesis of Insanity.

He said that whatever else mind might be it was in the first place a product of the functional action of certain of the cerebral neurons. For the normal manifestation of this functional action three factors were essential—namely, (1) integrity of the anatomical elements which form the physical basis of mind (cortical neurons); (2) suitable nutritional conditions for these anatomical elements; and (3) those sensory impulses which, commencing to impress the anatomical elements at an early period of life, gradually endow them with their special functional powers and of which the almost continual stimulus is required in order to call these powers into action. Morbid mental action might primarily depend upon a fault on the part of any one of these factors. He discussed the importance to be attached to inherent and acquired faults on the part of the cortical neurons, to the effects of sensory impulses, and to unsuitable nutritional conditions. The last might consist either in a deficiency of certain nutritive materials required by the nerve-cells or in the presence of chemical substances which were taken up by the cells and then disordered their metabolism. Any such substance was a toxin. He contended that by far the larger proportion of inherent predisposition to insanity was not based upon any condition that could rightly be called degenerative, but depended merely upon the presence of one extreme of those wide though limited differences that individuals exhibit in the reactive qualities of their nerve-cells to various forms of toxic action. He specially insisted upon the importance of the indirect action of toxins upon nerve-cells by causing disease of their nutrient vessels. The various toxic conditions which tended to affect the nerve-cells might arise from (1) exogenous toxic agents, (2) infections, and (3) auto-intoxication and auto-infection. Special importance was attributed to alcohol, syphilis, and auto-intoxication, and auto-infection from the gastro-intestinal tract. He maintained that various forms of toxæmia of gastro-intestinal origin were the chief factors in the pathogenesis of a large array of acute and chronic diseases, including several forms of mental disease. These diseases comprised the various manifestations of arterio-sclerosis, a large proportion of cases of senile insanity, general paralysis, locomotor ataxy, chronic alcoholic insanity, dementia præcox, idiopathic epilepsy (as the determining cause of the fit), and most cases of acute and chronic mania and melancholia and of chronic Bright's disease. The large majority of cases of insanity were not primarily diseases of the brain at all, but were dependent upon the action of toxins derived from elsewhere, which affected the functional activity of the cortical neurons by disordering their metabolism and often permanently damaging and even destroying large numbers of them. He endorsed the

opinion of Dr. Mercier that "insanity is a disease of the whole organism which can only be properly understood and properly dealt with when so regarded." Not until such views were generally recognised by alienists and gave direction to their investigations into the nature of insanity, would any important further advances be made towards those great preventive and therapeutic measures that were, beyond all questions, attainable in this department of practical medicine.

ANATOMY AND PHYSIOLOGY.

WEDNESDAY, JULY 31ST.

The Presidential Address.

Dr. A. MACALISTER, Professor of Anatomy in the University of Cambridge, opened the work of this section with some remarks on

The Anatomy Act and the Teaching of Anatomy.

He said: One of the consequences of the specialism characteristic of the modern development of the sciences ancillary to medicine is that many of the more interesting new advances in these branches of knowledge are not of much interest to the practitioner. This is particularly the case as regards anatomy. The growth of that science of late years has been greatest on its morphological side, and it must be confessed that as yet the practical applications of these modern extensions are not obvious on the surface. I do not say that they are quite devoid of practical interest, for it is our experience that the scientific curiosities of one period are the fundamental principles of the necessities of the next. Neither do I mean to say that practical anatomy has ceased to be the groundwork of the studies of the medical student. Present-day surgery, which boldly adventures into regions of the body whereinto our predecessors dared not enter, requires those who practise it to possess an intimate knowledge of parts of the body which a century ago were only regarded as of speculative importance. The knowledge of the minute details of the relational anatomy of the abdominal organs and of cranio-cerebral topography are necessary parts of the education of the modern surgeon, as is that of the complex system of nerve paths and neuron groups an essential element of the knowledge of a modern physician. The work of the dissecting-room and histological laboratory bulks as largely as ever in the curriculum of the twentieth century medical student, and as with the increased burdens which a wider range of education has made essential the medical student cannot spend quite as much time as heretofore in anatomical study it behoves us to see that these departments of our medical schools are as perfectly equipped as possible.

Now it happens, from the nature of the case, that the study of practical anatomy labours under difficulties which do not beset any of the other fundamental sciences. The professors in the other departments can in open market procure the materials for the supply of their laboratories in a way which the anatomist cannot. It is true he can buy bones, models, and casts, but they are only a very small part of his equipment; it is impossible to teach anatomy without an adequate supply of bodies for the dissecting-room, and every year the problem of that supply is becoming more acute. This growing difficulty depends on several conditions, some of which are inseparable from the material and intellectual progress of the age. Better wages and improved education have raised the worker in the community to a higher and more independent and satisfactory position. The proportion of those who are driven by stress of want into the State-provided asylums for the destitute is diminishing. Improved postal and telegraphic communication enables the relatives of any who, from their faults or misfortunes, have become submerged to receive notification of their whereabouts, and in the event of their death increasing facilities of transport enable them to claim the bodies far more easily than was the case half a century ago.

It is not, however, the lack of available material that is as yet the chief difficulty. We are a long way off the condition of social and ethical perfection in which there is no submerged fraction of the population, and while humanity continues as it is the poor we shall ever have with us, and among them there is little prospect of the disappearance of the class who by their own vices or follies have sundered themselves from their connexions and who find ultimate refuge in the State-aided asylums. Why, then, should there be the difficulty? How has it come to pass that with no great diminution of the number of unclaimed bodies many of the London medical schools were starved of their needful supply last year? How, also, does it happen that in the records of the advance of anatomical science this country is distinctly falling behind its continental neighbours? A foolish piece of insular prejudice has attached a sense of deprecation to the term "made in Germany"; but, as in other sciences, so in anatomy. It is to the article made in Germany we must go if we want to find the most trustworthy and accurate anatomical investigation and the results of the most patient work. It is to German laboratories our men must go if they wish to be trained for research and to find the facilities for original work. It is not that our students are inferior in ability or less zealous in the pursuit of knowledge, but it is largely a question of lack of material, as in our schools nearly all the available material is ear-marked for elementary teaching.

The reason why the condition of things is so different in Germany is this: that there the law of the land makes provision for anatomical teaching. The unclaimed bodies of those persons who die in any public institution are *ipso facto* sent off to the university of the district. A similar law exists in Russia, Austria, and France. In this country there is no provision whatever made by law for anatomy. It is left to the professor of anatomy to endeavour to obtain what material is wanted. In my recently published Memoir of Professor Macartney I have dealt at some length with the subject of anatomical legislation in Great Britain, so I need only indicate one or two of the points in the law which affect the teaching of this subject. There is one Act of Parliament, c. 75 of the 2 and 3 William IV. passed in 1832. This Anatomy Act is simply of a permissive nature, one which neither provides nor even suggests any method whereby bodies can be procured. It only permits any medical man being licensed by the Home Secretary to practise anatomy provided he practises it in a licensed place. It requires that the Home Office must be notified of the receipt of a body within 24 hours of its arrival, and that a medical certificate of the cause of death must be sent with the notification. It further requires that the body must be buried with whatever religious rites are usual in the particular denomination to which the deceased belonged, and in a public cemetery, and that the formal burial certificate must be lodged in the Home Office at or before a specified date. Under these conditions a medical man is not liable to prosecution for practical anatomy. Strangely enough, the Act provides no penalties for breaches of it, nor is there any machinery for prosecuting those who infringe it. The Act empowers the Home Secretary to appoint inspectors, but says nothing whatever as to their duties or authority; and, although they are supposed to be endowed with mysterious powers, it is not from the statute that they derive such, if they really possess them.

So far the legislation only restricts the practice of anatomy. Before the Act was passed there was nothing to prevent any man from dissecting a body anywhere, so long as the act was not capable of being construed into a scandal *contra bones mores*. Its only positive provision is that it declares the right of anyone having legal custody of a body to hand it over to the licensed anatomist not sooner than 48 hours after death. It does not define what legal possession means, and, considering that it has been decided by more than one judicial authority that a corpse is not property and cannot be dealt with or bequeathed by deed or will, it is difficult to see how one can possess what is not property. The permission granted in the Act is no new thing; from the beginning of systematic medical training in England in the thirteenth century the right to dispose of a body by those in whose possession it was has been unquestioned. The Act therefore gives no power which did not exist before. The result of the Act simply is that the anatomist is made to share with the publican and the pawnbroker this distinction—that he cannot practise his craft except on licensed premises, he himself also being licensed. He is not in any way helped forward towards his supply. He is left to himself to seek out those that have cadavera in custody, and is not aided in his efforts to persuade them to hand them over to him. In practice it comes to this—that the anatomist seeks the Poor-law guardians and endeavours to obtain his supply from them. Now, Poor-law guardians are periodically elected. The constituency returning them is wide and the franchise qualification minimal. The office is much desired by a considerable section of the community and hence the elections are often contested. The Englishman is a sentimental person, and those seeking his vote can gain the interest of the elector in no more sure way than by working on his feelings and sympathies. Experience has shown

that there are few ways in which an independent guardian can imperil his seat more certainly than by voting for the sending of unclaimed bodies to the anatomy school. The anatomist in consequence looks forward with anxiety to each periodical election of guardians in any union in which he has succeeded in persuading the majority of the guardians to grant him a supply. Indeed, it seldom happens that a re-election passes without some attempt being made in the interest of sentiment to stop the sending of subjects for dissection. Professor Macalister concluded by detailing his personally unpleasant experiences in dealing with the guardians and expressing his belief that no measure of improvement may shortly be expected.

TROPICAL DISEASES.

WEDNESDAY, JULY 31ST.

The Presidential Address.

Major RONALD ROSS, I.M.S. (retired), Lecturer in Tropical Medicine, University College, Liverpool, was unable to deliver his presidential address to the section in person, being abroad. His address, which was read for him, was as follows:—

I have great pleasure in being able to record for the last year a general and perhaps unparalleled advance in our knowledge regarding tropical diseases.

Yellow fever.—The discovery of at least one mode of infection in yellow fever—a discovery of the highest importance to mankind—emanates from America. For some time past several of our American colleagues, stimulated by recent observations in connexion with malaria, have sought an experimental verification of the hypothesis of Finlay and others that yellow fever also is communicated by the bite of gnats. Insects fed on patients were subsequently induced to bite healthy persons who volunteered for the experiment. The results were negative until the gnats were kept for an interval of 12 or more days between the two operations. Success was now immediate. Dr. Reed, Dr. Carroll, and Dr. Agramonte record in their last report that out of seven non-immune persons subjected by them to the bites of infected mosquitoes six yielded undeniably positive reactions. At the same time seven non-immunes whom they endeavoured to infect by means of the fomites of patients under peculiarly favourable circumstances remained in every case free from the disease. The experiments were conducted under the most stringent scientific conditions. Although the mosquito theory of yellow fever does not possess the parasitological basis of the mosquito theory of malaria, yet the differential observations of Reed, Carroll, and Agramonte are of a nature to leave no doubt concerning the soundness of their conclusions. Some of the tests have involved great heroism on the part of those who were subjected to them. Since the death of Dr. Jesse W. Lazear we have to deplore that of Dr. Walter Myers, one of our most promising young pathologists, who lost his life from yellow fever when on a deputation from Liverpool to study that disease. If the pathogenic organism of yellow fever, hitherto undiscovered, prove to be a vegetable organism, the fact will suggest that transference by suctorial insects and arachnids, with which we are already so familiar in the case of animal parasites, may be no less common in the case of vegetable parasites. *A priori* there is nothing improbable in the view that suctorial insects may become generally infected by blood containing schizomycetes, which may next find their way by route of the insects' salivary glands or otherwise into a fresh host. There are certainly some epidemiological facts which suggest the possibility of infection by gnats in undulant fever and perhaps leprosy, and by other vermin in relapsing fever, typhus fever, and perhaps several skin diseases.

Ankylostoma duodenale.—Another important advance is contained in the confirmation of Giles's life-history of the ankylostoma duodenale by Annett—details of which will shortly be published. These observations throw a vivid light on the route of infection adopted by these dangerous and widespread parasites.

Undulant fever.—Owing to observations made by Wright on the serum reaction in undulant (Malta) fever, this disease has been shown to exist in India, Hong-Kong, the United States, the West Indies, and Brazil—a most important fact in connexion with the great subject of tropical fevers.

Malaria.—The recent advance in our knowledge of malaria has been well maintained by numerous observers. The practical side of the mosquito theory, which at once became predominant after the determination of the life-history of the parasites, has been energetically treated by Koch and his assistants, who have successfully dealt with malaria on a large scale by means of quinine. Similar work has been performed with success in the United States, and, according to reports, in Italy. In British possessions isolated efforts to deal with malaria according to the new principles have been made by Sir William McGregor and Strachan at Lagos, and by Thomson and Young at Hong-Kong; but the country generally has not adopted an intelligent attitude in this connexion. On the other hand, British workers have closely studied details of the malaria question in many parts of the world. I must refer especially to the good work done in Central and West Africa by the Malaria Commission of the Royal Society and to an admirable sanitary survey of Nigeria made by the Liverpool expedition during the last year. Direct cultivations of the parasites have been reported by Daniels, Ziemann, van der Scheer and van Berkelom, and Woldert in various countries—all in anopheles; while Manson has completed an interesting crucial experiment for the popular demonstration of the theory by infecting healthy persons (T. Manson and Warren) in London by mosquitoes brought from Italy, and by simultaneously preserving others (Sambon and Low) in health in the Campagna in a mosquito-proof house. Nuttall and Shipley, Christophers and Dutton have closely examined the anatomy of gnats. Nuttall, Cobbett, and Strangeways-Pigg have made interesting researches on anopheles in England, in which, by the way, cultivation experiments have hitherto failed. Gosio, Giles, Reinhold, Ruge, Fearnside, Neveu-Lemaire, and others have done useful work on the subject in many directions. It remains, however, a matter for regret that stronger efforts have not been made to determine the reason why individual gnats of an amenable species so often resist infection. Until this difficulty is cleared away negative experiments with culex cannot be entirely convincing.

Since the last annual meeting of the Association the mosquito theory of malaria has received the highest scientific acceptance in the address of the then President of the Royal Society, Lord Lister.

Filariasis.—In regard to filariasis the discovery of Low and James has been confirmed and amplified by several observers. Manson has suggested the possibility of reducing lymphatic varix by leading a lymphatic duct below the stricture into a neighbourhing vein.

Plague.—The prompt suppression of plague in Glasgow has further demonstrated the value of energetic sanitary measures in this disease, and the large demand for plague vaccine gives encouraging evidence in favour of Haffkine's prophylaxis.

Beri-beri.—The close clinical similarity of beri-beri and chronic arsenical poisoning seems to suggest that many cases attributed to the former disease may possibly be in reality due to arsenic.

Work for the future.—It seems to me that further researches are at the present moment most urgently required in connexion (1) with tropical fevers; (2) with the flora and fauna of the intestine in tropical bowel complaints; and (3) with the question whether European children in the tropics suffer as frequently from malaria as do the children of natives. The practical necessity of taking measures against the uncontrolled propagation of gnats in tropical cities is one which, in view of recent discoveries, can no longer be set aside by sanitary authorities without dereliction of duty.

The profession owes its sincere thanks to all those gentlemen who have done so much during the past year—often without remuneration and at considerable personal risk—for the cause of tropical medical science. It also owes its thanks to those British merchants who have generously subscribed large sums of money for the prosecution of many of the researches to which I have referred.

NAVY, ARMY, AND AMBULANCE.

WEDNESDAY, JULY 31ST.

The Presidential Address.

Deputy-Surgeon-General W. G. DON delivered the following introductory remarks at the opening of the section.

Service Medical Problems.

To facilitate procedure during the three days at our disposal we propose to discuss, first, naval; secondly,

military; and thirdly, civil matters, so far as can be arranged. On naval questions we are promised papers by naval medical officers on most important subjects—namely, the disposal of the wounded in naval actions, and the relative healthfulness of modern warships, to which attention has lately been called. I will not venture to anticipate what may be said on these matters further than to remark that while we probably have data sufficient for arriving at some definite conclusions as to the healthfulness of ironclads, our experience is as yet very limited regarding the disposal of the wounded in modern sea fights. The subject is complicated on account of the many different structural types of our warships, each requiring special contrivances of its own. I may be allowed to express much personal interest in such naval problems, because of lasting early experiences, for it was my fortune to learn something of the interior economy of our wooden walls of 50 years ago, having served for six months as a medical volunteer in H.M.S. *Duke of Wellington*, flagship of the Baltic Fleet of 1855, and taken part in the three days' bombardment at Sweaborg. Such a reminiscence brings the obvious reflection how marvellously and completely have naval life and warfare changed within my own limited recollection. With the military medical problems which may engage our attention I am, after 44 years' consecutive and continuous service in the army, naturally very fairly conversant. I confess that I regard these problems, after the experience of many mutations both in the home and Indian services, as still presenting grave difficulties, and even dangers, unless warily and judiciously handled. Major Dick, R.A.M.C., assistant professor of military surgery, Netley, was to have recounted some aspects of small-bore wounds as inflicted during the war which have come under his direct observation, but we regret his inability to do so. We already know sufficient of such wounds to warrant the anticipation that when the full surgery of the war is made known we shall have some startling revelations, especially in regard to penetration of viscera by small-bore bullets. I lately saw a wounded soldier on sick furlough who while lying down was hit by a Mauser bullet; the missile entered the right chest below the armpit and, passing in a slanting direction, emerged in the region of the left kidney. From its course and the resulting symptoms several of the important viscera could not have escaped penetration; yet months afterwards, when I saw him, the only inconvenience experienced was occasional spasm of the diaphragm on sudden exertion. When we meet with such cases and can recall the terrible visceral wounds inflicted by the expanding Minié bullet of 40 years ago, or even by the still more recent Snider or Martini, the pencil-like missiles of the latter-day magazine rifles seem comparatively almost harmless. Field transport for sick and wounded, on which Captain Ward, R.A.M.C., promises to give his recent war experiences, is a subject of great importance and some difficulty, for it is part of the bigger question of army field transport at large, which cannot, or ought not, to be fixed and fettered by inelastic rules, because it must vary widely according to three factors which may operate in any given campaign. These are: the physical nature of the country in which military operations are conducted; the length of the lines of communication; and the required mobility of the fighting force. It is an open question whether the medical service should not have complete autonomy in its field transport, of whatever kind; but I am not inclined to lay much stress on the point further than that it should be autonomous, subject alone to the express disposition of the general officer in command. For necessity—and specially military necessity—can have no law beyond or over-riding that of preservation of the fighting force; and, consequently, however autonomous in theory the medical or other branches of transport may be, there is always the risk, even the probability, that under the pressure of military exigency (as after Paardeberg), it may be appropriated for the supreme transport of food and ammunition. Intimately bound up with the kind and amount of field medical transport is the question of its use, under new conditions, in affording first aid to the wounded in an action. The enormous widening of the zone of fire from modern weapons makes all active duties connected with stretchers and ambulances increasingly difficult and dangerous. It is now next to impossible with any safety for bearers to keep in touch with an advancing fighting line, while the distances between the combatants may be so great as to render the distinguishing of red crosses and Geneva badges impossible; hence probably the complaints that the ambulances have been deliberately fired on. Not only does the range of fire exceed that of unaided vision, but the use of smokeless powder makes location of a firing line more a matter of the ear than the eye; there is plenty of noise but little to be seen. A wounded cavalry soldier told me he had been six times under fire, but never once saw a living fighting Boer while engaged. In means for affording civil first aid to sick and injured persons in our great urban centres we seem lamentably behind many continental and American cities. We all trust this reproach may before long be removed. It is a question whether motor might not be substituted for horse ambulances for all emergent purposes. Important questions connected with enteric fever will be brought to your notice.

THE ANNUAL MUSEUM.

The allotment of space this year for the annual exhibition of drugs, foods and food products, surgical appliances, and the like, was decidedly generous. Moreover, the Winter Garden itself, in which the exhibit was held, proved a source of attraction, and the lawns outside formed a pleasant retreat and promenade. It was evidently the intention of the organising authorities to make this section of the meeting more attractive and interesting than on previous occasions and in this intention they succeeded. To begin with, the members and friends were invited to an "At Home" and reception in the Winter Garden and grounds on the opening night of the meeting (Monday, July 29th). The spacious lawns were prettily illuminated with fairy lamps and light refreshments were provided under gaily decorated marquees. There was a very considerable response to the invitation and in this way practically the whole of the members and their friends were brought into acquaintance with the fact that an interesting exhibition could be witnessed and that as soon as the social aspect of the gathering had subsided the visitor could more seriously turn his attention to the interesting and attractive array of new medicinal preparations, new methods of administration, new clinical apparatus, new surgical appliances, and even newly designed broughams and motor-cars specially constructed for the use of the general practitioner. The exhibition was an undoubted advance on those of previous years, not excepting even that in London. Indeed, the number of exhibitors exceeded those of all previous occasions by at least 25 per cent. and the interest shown by the visitors was not less than before, while the attendance was proportionately satisfactory. All this was, of course, highly appreciated by the exhibitors themselves and the visitor's interest in the exhibition was maintained. The organising authorities may be heartily congratulated upon thus devoting more attention than usual to this important and interesting section of the annual meeting. The show in the Winter Garden called to mind an exhibition in the Crystal Palace, but of course on a somewhat smaller scale. In the centre of the "garden" was a fountain which proved an important adjunct in a space where many people were gathered together. There can be no doubt that a stream of water through the air freshens and cools it. At the rear of the Winter Garden was a large marquee in which were displayed models of broughams, motor-cars, motor-cycles, and ambulance wagons. For the convenience of visitors a lounge was provided and refreshments could also be obtained in another well-appointed section. The accommodation provided on the present occasion was much more adequate and much more comfortable than in past years. The exhibition is bound to be of a more or less trade description, but we still think that some acceptable relief might be brought into the exhibition by having here and there a few demonstrations of a really scientific kind. As in previous years, the only exhibit that could be claimed to be of this class was the x-ray apparatus. Last year, on the occasion of the exhibition at Ipswich, we pointed out that practically no steps were taken to keep out of the museum a merely curious public to whom in many cases samples of the latest remedy for headache, &c., were freely supplied. We suggested that this indiscriminate distribution of, perhaps, powerful drugs was undesirable, and apparently our suggestion has been acted upon as far as possible, for only those were admitted to the museum who could show cards or who could give evidence that they were in some way or other connected with the medical profession. Members of the medical profession only were allowed in the pathological museum adjoining.

In noticing the more important exhibits this year some classification is convenient and for this purpose we may adopt the following heads:—I., Drugs; II., Foods and Food Products; III., Sanitary Appliances, Disinfectants, &c.; IV., Surgical Instruments and Appliances; V., Mineral Waters, Beverages, &c.; VI., Publications; VII., Miscellaneous.

I.—DRUGS.

On the whole no striking departure in regard to drugs can be recorded of the exhibition this year. There seemed to be a tendency to give more attention to the old style of preparations, and instead of drugs in the many portable forms being shown, extracts, essences, emulsions, tinctures, and elegant fluid preparations were rather the rule. Most of the stalls were arranged with considerable skill and certainly the *tout ensemble* would be much less attractive if drugs, liquid and solid, put up in all sorts and shapes of glass bottles, jars, and trays, coloured and uncoloured, were not exhibited. The stall of Messrs. Ferris and Co. of Bristol was particularly well arranged and displayed evidences of decided energy and skill. The various exhibits were most attractively grouped and besides drugs there were a number of "up-to-date" surgical and medical appliances on view. Among the novelties we may mention the saxol petroleum emulsion, a combination of a highly refined petroleum with the hypophosphites; an antiseptic ether soap for cleansing the hands before and after operating and for preparing the skin of patients previously to operation; compound menthol and liquorice pellets; a small urine test case for the pocket, and many other preparations besides those described equally exemplifying pharmaceutical skill. Lastly, we should mention the excellent series of vaccination pads made by this firm, that known as No. 20 having a plain absorbent centre with a self-adhesive margin. There were many notable examples of modern pharmaceutical preparations on the well-arranged stall of Messrs. Wyleys, Limited, of Coventry. Amongst these should be mentioned the syrup glycerophosphates, a clear and permanent solution of the various glycerophosphates and very palatable; "tropels," or compressed lozenges, made in accordance with B.P. requirements; ointments in flexible tubes, including ophthalmic ointments; neuracetin, a carefully designed, antipyretic, and analgesic; sapolette powder, a special soap in powder form; antiseptic jellies; non-alcoholic tinctures and standardised tinctures; and various improved compound preparations. Equally effective was the display of Messrs. C. J. Hewlett and Son of 35-42, Charlotte-street, London, E.C. Amongst the new drugs shown here were the fluid extract and tincture of monsonia, which has been used with success in the treatment of dysentery and diarrhœa, isphagul, for the same disorders, and preparations of the cacodylates. The exhibit included some useful sets of clinical tests in urine analysis and a series of original pharmaceutical preparations well known in connexion with this firm. Amongst these were mist. senecio co. and mist. tussi. rub. conc., and a liquid ether soap. Amongst the novelties on the stall of Messrs. Oppenheimer, Son, and Co., Limited, of 179, Queen Victoria-street, London, E.C., were the suprarenal fluid extract, palatinoids of tinctures prepared from carefully standardised concentrated solutions, traumatol or cresylic acid, a bactericidal agent not less powerful than mercuric chloride, and many ingenious and effective vaporisers. To these we should add a new hypodermic case not larger than a cigarette case containing a hypodermic syringe with regulating plunger, two steel needles, a bundle of wires, and 17 tubes of Messrs. Oppenheimer's soluble hypodermics. Palatinoids also are now prepared containing the compound glycerophosphates. The palatinoids serve to preserve the glycerophosphates from the influences of the atmosphere. Messrs. Parke, Davis, and Co. of 111, Queen Victoria-street, London, E.C. had a stall full of examples of modern pharmaceutical advance. Amongst these should be mentioned adrenalin, the active principle of the suprarenal gland, a powerful astringent, hæmostatic, and cardiac and vaso-motor stimulant. The exhibit included nucleinic acid compounds of mercury, silver, iron, and copper, and chloretone, a now well-known local anæsthetic, hypnotic, and antiseptic. A very interesting series of synthetics and other fine preparations was presented to view by the Bayer Company, of 20, Booth-street, Manchester. Amongst these were aspirin, a substitute for the salicylates; epicarin, a powerful parasiticide; heroin, a morphia derivative which does not cause constipation, while it stimulates expectoration; protargol, the silver proteid preparation now of known value in gonorrhœa; and several somatose preparations. The feature of the stall of Messrs. Burgoyne, Burbidges, and Co., 12 and 16, Coleman-street, London, E.C., were some interesting new silver preparations. Amongst these were collargolum, described as metallic silver in a new allotropic modification, quite soluble in water. It is said to be non-irritant and non-poisonous, but an effective antiseptic. The citrate and lactate of silver may also be mentioned, the latter being supplied in powder form and in tablets. Mr. Frank A. Rogers of 327, Oxford-street, London, W., exhibited a very interesting set of approved forms of medical sprays and atomisers besides various pharmaceutical preparations. Amongst the latter was a clear colourless oil, a specially refined petroleum product without taste and odourless, and known as "aquol." The same oil is modified by the addition of benzoin; both are used in a special spraying apparatus designed by Mr. Rogers, which has the advantages of simplicity of design, of being easily cleaned, and of producing a uniform spray. Mr. E. Merck of Darmstadt (16, Jewry-street, London, E.C.) showed a very great number of his well-known fine pharmaceutical chemicals, including alkaloids, glucosides, organic and physiological preparations, reagents, and some beautifully pure specimens of modern drugs, chiefly synthetics. Amongst the latter may be mentioned cacodylic acid and the cacodylates; bromipin, an organic bromide; iodipin, an organic iodide; jequiritol, and many others. The materia medica and pharmacology of all these are described in Merck's circular. Local pharmacy was well represented in the exhibit of Messrs. Thomas Brothers of Bath-road, Cheltenham. They showed the interesting combinations of albumin with the halogens—namely, chloralbacid and iodalbacid. The exhibit included an assortment of photographic apparatus and clinical thermometers. At the stall of Messrs. Arthur and Co. of 69, Berners-street, London, W., special emphasis was laid upon the value of bromaurum and hydraurum, the former being a double salt of gold and arsenic, for the treatment of neurasthenia, epilepsy, and rheumatism. Some interesting synthetics were shown at the stand of Messrs. Zimmer and Co. of Frankfort-on-Maine. Amongst these were euquinine, described as a tasteless quinine and possessing the same anti-malarial properties but not causing "cinchonism" or gastric disturbance. Again, eupyrine is described as far superior to phenacetin, producing no depression on account of the vanillin contained in its molecule. Messrs. Corbyn, Stacey, and Co., of 300, High Holborn, London, W.C., had an excellent assortment of new pharmaceutical preparations, including the cacodylates, among them being a useful modification for tuberculous patients—namely, the cacodylate of guaiacol. The exhibit included also aspirin and chloretone, the comparatively new anæsthetic prepared from chloroform, acetone, and potash. These pharmacists have published some very useful notes on new drugs. The Abbey Effervescent Salt Company, of 144, Queen Victoria-street, London, E.C., devoted the space allotted to them entirely to their special preparation, Abbey's effervescent salt. We have quite recently dealt with this agreeable saline aperient in our analytical columns. What are now well-known as the Fairchild products were exhibited by Messrs. Fairchild Brothers and Foster, Snow Hill-buildings, London, E.C. Amongst these products were diazyme, a clear essence containing animal diastase, the active digestive properties of which we have confirmed in our laboratory experiments; other digestive preparations, and enzymol, a purified solution of the proteolytic enzyme. Mr. Peter Möller of 18, High Holborn, London, W.C., exhibited a very interesting model of the apparatus in which hydroxyl-free cod-liver oil is produced. As we have previously shown, the excellence of Möller's oil depends upon this particular method of preparation which prevents the formation of objectionable hydroxyls which endow cod-liver oil with nauseating properties and a tendency to cause unpleasant eructation.

(To be continued.)

Medical News.

SOCIETY FOR THE STUDY OF DISEASE IN CHILDREN.—At the annual general meeting of this society, held in London on July 26th, Dr. A. E. Sansom being in the chair, it was stated that during the past session the membership had increased from 102 to 237. A volume of reports will be issued shortly. The following office-bearers were elected at the meeting: Mr. Henry Armstrong (Wellington College), Dr. Henry Ashby (Manchester), Dr. Fletcher Beach,

Dr. James Carmichael (Edinburgh), Dr. Edmund Cautley, Dr. Wayland Chaffey (Brighton), Dr. Leonard Guthrie, Dr. Robert Hutchison, Dr. Charles Macalister (Liverpool), Dr. John McCaw (Belfast), Dr. Lewis Marshall (Nottingham), Dr. Ernest Sansom, Dr. George Shuttleworth, Dr. George Sutherland, Dr. Frederick Taylor, Dr. James Taylor, Dr. Charles Willey (Sheffield), and Dr. Dawson Williams. Mr. Watson Cheyne, Mr. Walter Edmunds, Mr. Francis Jaffrey, Mr. Robert Jones (Liverpool), Mr. Betham Robinson, and Mr. Alfred H. Tubby were appointed members of the council. Mr. R. Clement Lucas was appointed honorary treasurer and Mr. Sydney Stephenson, Dr. George Carpenter, and Dr. Theodore Fisher (Bristol) were elected honorary secretaries.

DEVON AND EXETER HOSPITAL.—At the quarterly meeting of the supporters of the Devon and Exeter Hospital, held on July 25th, it was reported that the unfavourable balance of £2535 had been reduced, mainly by a legacy, to £872.

MEDICAL MAGISTRATE. — Mr. Thomas John Carson, L.F.P.S. and L.M. Glasg., has been placed on the Commission of the Peace for the Borough of Oldham.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Isolation Hospitals.

THE Bill to strengthen the powers of local authorities with regard to the construction and maintenance of isolation hospitals has now received the Royal assent and is therefore part of the law of the land.

Army Medical Service.

A debate on this subject was expected in Committee of Supply on Thursday, July 25th, but so much time was occupied with the discussion of the vote for the salary of the Secretary of State for War, that the Medical Vote had to be postponed.

Beer Bill.

The promoters of the Beer Bill, influenced by the prospect of difficulties in the Grand Committee and the pressure of Government business in the House of Commons, determined to abandon the Bill for he session, and on Friday, July 26th, the measure was formally withdrawn.

The Sale of Intoxicating Liquors to Children.

The Bill to prevent the sale of intoxicating liquors to children is now altered very much in form. The limit of age stands at 14 years instead of 16. Liquors sold or delivered in corked and sealed vessels in quantities not less than one reputed pint for consumption off the premises are excluded from the scope of the Bill altogether, and the sender of the child is made equally punishable with the licence-holder who sells or delivers the liquor to the child. The term "corked" is defined to mean closed with a plug or stopper, whether it is made of cork or wood or glass, or some other material, and "sealed" is defined as secured with any substance without the destruction of which the cork, plug, or stopper cannot be withdrawn.

HOUSE OF COMMONS.

THURSDAY, JULY 25TH.

Dr. Koch and Tuberculosis.

Mr. CAREW asked the President of the Local Government Board whether he was aware of the statement made at the British Congress on Tuberculosis by Professor Koch, and whether in consequence thereof he would cause the recommendation issued long since by the Local Government Board to the inspectors and medical officers of health to refrain from confiscating or destroying the bodies of animals alleged to be affected with localised tuberculosis to be carried out in future.—Mr. LONG replied: I am aware of the statement made by Professor Koch as to the non-identity of human and bovine tuberculosis, but I do not think that this view can at the present time be regarded as having received the general assent of scientific men. The matter is one which will require very careful consideration and I could not promise to take any action which is based on the view referred to.

Medical Provision for Sick and Wounded Officers.

General LAURIE asked the Secretary of State for War whether hospital accommodation was provided for sick and wounded officers returning to this country from the seat of war; if so, whether the accommodation provided had been found sufficient for all cases that required attention; and whether for such officers as were not accommodated in hospital professional attendance was furnished at the public expense, and a pecuniary allowance given to meet the cost of private hospital, provision of nurses, or other necessary outlay.—Mr. BRODRICK replied: At Netley 16 beds are available and 75 officers in all have been treated there. At Herbert Hospital two beds are available, but none have applied to be treated there. More officers might have availed themselves of the accommodation provided in these hospitals. As regards private accommodation it was provided in some cases free of expense owing to the generosity of private organisations. The question of providing for private medical attendance at the public expense is under consideration.

Lead Poisoning Cases.

Mr. COGHILL asked the Home Secretary whether he was aware that, out of 64 cases of lead poisoning reported during June, only eight cases were in the china and earthenware trades; and could he state in what trades chiefly the remaining 56 cases occurred; and for what reason the Home Office issued new special rules for the china and earthenware industries rather than for the trades where there were a greater number of cases of lead poisoning.—Mr. RITCHIE replied: The figures quoted by the hon. Member are correct, but it might be added that the eight cases in the china and earthenware trades included two out of the total of four fatal cases for the month. The remaining 56 cases were spread in small numbers over several trades. There is only one trade, the manufacture of white lead, in which the number of cases is greater than in china and earthenware, and for that trade new rules have recently been made. The reasons for proposing the new rules for china and earthenware are fully given in published reports and in letters to the manufacturers.

FRIDAY, JULY 26TH.

Typhoid Fever among the Troops.

Mr. BRODRICK, in reply to a question by Sir WALTER FOSTER, said that for the five weeks ended May 31st the admissions from typhoid fever among the troops in South Africa were 2300 and the deaths were 326.

MONDAY, JULY 29TH.

The Case of Dr. Scott Tebb.

Mr. CORRIE GRANT asked the President of the Local Government Board (1) whether he was aware that Dr. Scott Tebb was elected medical officer of health by the Urban District Council of Penge after open competition in response to public advertisement; (2) could he state why the Local Government Board refused to sanction the appointment; (3) whether he required a profession of belief in vaccination from all persons before sanctioning their appointment as medical officer of health; and (4) would he say what duties in securing vaccination were imposed on medical officers of health to urban district councils.—Mr. LONG replied: The case of Dr. Tebb was fully discussed a short time ago by the hon. Member and others on the vote for the Local Government Board, and, as then appeared, sanction to his appointment was refused on account of the views expressed by him in relation to vaccination. The answer to the third point in the question is in the negative. As regards the last point, a medical officer of health is much concerned with vaccination as being the most effectual means of preventing the spread of small-pox, and in the event of an outbreak of that disease in his district it would devolve upon him to do his utmost to promote vaccination and revaccination.

Case of Brass-poisoning.

Dr. FARQUHARSON asked the Home Secretary whether his attention had been called to an inquest recently held by the Birmingham city coroner on a young man named Martin Brannon, who died from pneumonia and tubercle, certified by Dr. Moir, medical officer to the Ladywood Dispensary, to be due to brass-poisoning; and whether, in view of the statement that a large proportion of the 2000 men, women, and girls employed in the 400 brass foundries of Birmingham were suffering, or had suffered, from the well-known symptoms of this disease, and that the coroner stated that this was a case for inquiry, he would cause inquiry to be made.—Mr. RITCHIE replied: My attention has been called to the case by the coroner. The question of the danger to health from dust in brass-polishing and in the polishing of other metals has for some time been engaging the attention of the factory staff and especially of the medical inspector of factories. I will make further inquiry into the matter and consider what steps ought to be taken.

Civil Surgeons with the Forces.

Mr. MACNEILL asked the Secretary of State for War whether the pay of civil surgeons who had served for three years with the Imperial forces would be rendered at the end of that period on a similar scale to the pay of members of the Royal Army Medical Corps.—Mr. BRODRICK replied that the matter was under consideration.

Research on the Subject of Cancer.

Mr. WEIR asked the First Lord of the Treasury whether he was aware that at a recent gathering of the foreign delegates to the Tuberculosis Congress reference was made to cancer as the one other disease which had up till now baffled the scientific and medical men of the world; and whether, in view of the increase of this disease, he would consider the advisability of the appointment of a commission or committee to inquire what steps could be taken for aiding research into the cause, cure, and prevention of this disease.—Mr. BALFOUR replied: I cannot believe that a commission would be the proper machinery for the carrying out of such a delicate and difficult matter of research as that referred to in the question of the hon. Member. The prevalence and the increase of this disease are occupying every medical mind over the whole of the civilised world and I do not think that the appointment of a commission would either aid or stimulate inquiry.—Mr. WEIR then asked the right hon. gentleman whether the Government would consider the advisability of appropriating a sum of money in aid of this research.—Mr. BALFOUR replied: It is necessary that some definite proposal should come to us indicating that the grant of public money might have satisfactory results before we could assent to any such course.

The Royal Commission on Arsenical Poisoning.

Sir CUTHBERT QUILTER asked the President of the Local Government Board, now that the Beer Bill had been withdrawn, what measures the Government proposed to adopt to prevent the introduction of deleterious or poisonous substances into beer, more particularly as the Royal Commission on Arsenical Poisoning in their report just issued expressed opinions conflicting with the majority report of the Beer Materials Committee, and again emphasised the fact that neither the Inland Revenue Department nor the Public Health authorities appeared to possess powers or machinery adequate for the efficient protection of the public.—Sir MICHAEL HICKS BEACH replied to the question, saying: I cannot accept my hon. friend's premisses. The Beer Bill proposed no machinery for preventing the introduction of deleterious or poisonous substances into beer, and as the presence of arsenic in beer was not suggested as a subject particularly deserving the consideration of the Beer Materials Committee, the report of the Royal Commission which

was confined to that point can hardly be said to conflict with the report of the committee. But I may say that so far as the action of the Inland Revenue authorities is concerned I am disposed to adopt the recommendations of the Royal Commission, assuming that measures can be devised for carrying them into effect. No time will be lost in considering this, but it may possibly be found to require legislation. Any recommendations as to the action of the public health authorities would rest with the Local Government Board.

The Government and Tuberculosis.

Mr. FIELD asked the President of the Local Government Board (1) whether he was aware of the resolution unanimously passed at the Tuberculosis Congress asking for the appointment of a Royal Commission to inquire into and report upon the communicability of bovine tuberculosis to the human species; and (2) whether the Government would consider the advisability of appointing such a commission and include in it practical men acquainted with the meat and milk trades, together with agriculturists and scientists.—Mr. LONG said: The answer to the first paragraph of the question is in the affirmative. As to the second paragraph I already have the matter under my consideration.

The Army Medical Service.

Captain NORTON asked the Secretary of State for War if he could state why the promotions due in the Army Medical Department on the late Director-General's retirement on June 1st last have not been gazetted.—Mr. BRODRICK replied: The various measures for the reorganisation of the Medical Department are not yet completed.—Captain NORTON: But what I desire to know is why the promotions of these officers have been delayed.—Mr. BRODRICK: The reorganisation might affect those promotions.

Plumbism in the Printing Trade.

Mr. TULLY asked the Home Secretary whether, seeing that the cases of plumbism in the printing trade for last year were one in every 3000 persons employed in type-setting, he would take any steps to exempt printers, bookbinders, and kindred trades from the operations of the lead-poisoning clause in the Bill for Amending and Consolidating the Factory Acts.—Mr. RITCHIE replied that since this matter was under discussion in the Grand Committee on Trade he had come to the conclusion that some alteration of the clause in question was necessary, and he was now considering the precise words of the amendment he would propose.

Musselburgh Infectious Diseases Hospital.

The LORD ADVOCATE, in reply to a question on the above subject, said: I learn from the Local Government Board for Scotland that there has been a correspondence with the local authority of the burgh of Musselburgh regarding the proposed alterations in the Musselburgh Infectious Diseases Hospital. The site and plans were approved by the Board of Supervision in 1887, at a time when the Board had no powers to insist on the erection of a proper hospital and when also sanitation was much less advanced than it now is as regards isolation of infectious disease. The building then approved was probably the best that could be made out of premises not erected for hospital purposes; it was better than no hospital at all and indeed greatly superior to the old cholera hospital. The Board had no correspondence with the local authority in 1889 regarding the matter. It was not until April, 1899, that in view of certain proposed alterations in the existing buildings the Board intimated that they had come to the conclusion that the hospital was not proper and adequate and that no alterations would make it so. It falls in every necessary of a modern hospital for the treatment of infectious disease, is entirely unworthy of a burgh of the importance of Musselburgh, and, in view of the proposal for alterations, the Board's desire in raising the whole question at present is to save the local authority expenditure which would be thrown away.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

ALLEN, WILLIAM T. D., M.B., B.Ch. R.U.I., has been appointed Medical Officer for the Fourth District of the Parish of Liverpool, vice S Caldwell, M.R.C.S. Eng., resigned.

BELFRAGE, SYDNEY H., M.B., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Assistant Anæsthetist to the Dental Hospital of London.

BERRYMAN, EDMUND N., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed District and Workhouse Medical Officer of the Llandovery Union.

BUCK, ARTHUR H., F.R.C.S. Edin., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Honorary Surgeon to the Brighton, Hove, and Sussex Throat and Ear Hospital.

BURGESS, ARTHUR H., F.R.C.S. Eng., M.B., Ch.B., M.Sc. Vict., has been appointed Surgical Officer and Medical Superintendent of the Manchester Cancer Pavilion and Home.

CAMPBELL, ALEXANDER, M.D. Aberd., F.R.C.S. Edin., Certifying Surgeon under the Factory Acts for the East District of Dundee, has been appointed to the similar position for the West District of Dundee.

HAWORTH, STEPHEN R., M.D., B.Ch., R.U.I., has been appointed District Surgeon of Bredeadorp, Cape Colony.

HEWLETT, RICHARD TANNER, M.D., M.R.C.P. Lond., has been appointed Professor of General Pathology and Bacteriology in King's College, London.

HICHENS, PEVERELL, M.B., B.Ch. Oxon., M.R.C.P. Lond., has been appointed Physician to the Northampton General Infirmary.

HOLLIS, HARRY, M.D., B.C. Camb., has been appointed Medical Officer to the Wellingborough Workhouse and District.

HUNT, ERNEST, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Medical Officer for the Kingsteignton District by the Newton Abbot (Devon) Board of Guardians.

HUTCHINSON, ARTHUR J., M.B., C.M. Glasg., has been appointed Honorary Assistant Surgeon to the Brighton, Hove, and Sussex Throat and Ear Hospital.

JACOBS, H. R., M.R.C.S. Eng., has been appointed District Medical Officer of the Brackley Union.

JOHNSON, ALICE N. VOWE, M.D. Brux., L.R.C.P., L.R.C.S. Edin., has been appointed Junior Assistant Medical Officer to the Carmarthen Asylum.

MARTINEAU, ALFRED J., F.R.C.S. Edin., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed Honorary Assistant Surgeon to the Brighton, Hove, and Sussex Throat and Ear Hospital.

PARRETT, EDWARD E., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Assistant Medical Officer at the Brentford Infirmary, Workhouse, and Schools.

PARSONS, CHRISTOPHER T., M.D. Lond., has been appointed Medical Officer for Receiving School for Children at Parson's Green.

RANSOME, GILBERT H., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed District Medical Officer of the Depwade Union.

SINCLAIR, AGNES BRYMNER, M.B., Ch.B. Glasg., has been appointed Resident House Surgeon of the Carlisle Dispensary.

THOMSON, STCLAIR, M.D., M.R.C.P. Lond., F.R.C.S. Eng., has been elected Assistant Physician for Diseases of the Throat in King's College Hospital.

TREVES, EDWARD, M.R.C.S. Eng., L.R.C.P., has been appointed Honorary Consulting Surgeon to the Brighton, Hove, and Sussex Throat and Ear Hospital.

WATSON, JAMES, L.R.C.P., L.R.C.S. Edin., has been appointed District Medical Officer of the Alnwick Union.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BIRMINGHAM AND MIDLAND SKIN AND URINARY HOSPITAL, John Bright-street.—Surgical Assistant for six months, renewable. Honorarium at rate of 50 guineas per annum.

BIRMINGHAM GENERAL DISPENSARY.—Resident Surgeon. Salary £150 per annum (with allowance of £30 per annum for cab hire), and furnished rooms, fire, lights, and attendance.

BIRMINGHAM WORKHOUSE.—Duly qualified Medical Man. Remuneration £3 3s. a week and all found except alcoholic liquors.

BRECON INFIRMARY.—Resident House Surgeon, unmarried. Salary £100 per annum, with furnished apartments, board, and attendance.

BRIDGWATER INFIRMARY.—House Surgeon. Salary £80 per annum, with board and residence.

BRIGHTON, HOVE, AND SUSSEX THROAT AND EAR HOSPITAL, Church-street, Queen's-road, Brighton.—Non-resident House Surgeon. Salary at rate of £75 per annum.

BRISTOL GENERAL INFIRMARY.—Casualty Assistant House Surgeon. Salary £50 per annum, with board, residence, &c.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Second House Physician for six months. Salary at rate of £30 per annum, with board, residence, and washing.

CLAYTON HOSPITAL AND WAKEFIELD GENERAL DISPENSARY.—Junior House Surgeon, unmarried. Salary £80 per annum, with board, lodging, and washing.

CRAIGLEITH POORHOUSE AND HOSPITAL, Edinburgh.—Resident Medical Officer. Salary at rate of £100 per annum, with board and apartments.

DENBIGHSHIRE INFIRMARY, Denbigh.—House Surgeon. Salary £100, with board, residence, and washing.

DEVON COUNTY ASYLUM, Exminster.—Third Assistant Medical Officer Salary commencing at £125 per annum, and increasing at the rate of £10 per annum to £155, with board, residence, &c.

DEVONSHIRE HOSPITAL, Buxton, Derbyshire.—Assistant House Surgeon. Salary £50 per annum, with furnished apartments, board, and washing.

DISTRICT HOSPITAL, West Bromwich.—Resident Junior House Surgeon. Salary £50 per annum, with board, lodging, washing, and attendance.

EAST SUFFOLK AND IPSWICH HOSPITAL.—Second House Surgeon, unmarried. Salary £80 per annum, with board, lodging, and washing.

ESSEX AND COLCHESTER HOSPITAL.—House Surgeon.

GUEST HOSPITAL, Dudley.—Assistant House Surgeon for six months. Salary £40 per annum, with residence, board, and washing.

HULL ROYAL INFIRMARY.—Casualty Officer. Salary £60 per annum, with board and lodging.

KENT AND CANTERBURY HOSPITAL.—Assistant House Surgeon, unmarried. Salary £80 a year, with board and lodging.

LAWN HOSPITAL FOR INSANE, Lincoln.—Assistant Medical Officer. Salary £100.

LEWES DISPENSARY AND INFIRMARY AND VICTORIA HOSPITAL.—Resident Medical Officer. Salary £100 per annum, furnished apartments, board, coal, gas, and attendance.

LINCOLN COUNTY HOSPITAL.—Assistant House Surgeon for six months, eligible for re-election. Honorarium of £25 for each period of six months, with board, residence, and washing.

LIVERPOOL DISPENSARIES.—Assistant Surgeon. Salary £100 per annum, with board and apartments.

NOTTINGHAM GENERAL DISPENSARY.—Assistant Resident Surgeon, unmarried. Salary £160 per annum, increasing £10 every year, with furnished apartments, attendance, light, and fuel.

OXFORD, COMBINED RURAL AND URBAN DISTRICT COUNCILS OF.—Medical Officer of Health. Salary £750 per annum.

PRESTON ROYAL INFIRMARY.—Assistant House Surgeon. Salary £80 per annum, with board, lodging, and washing.

ROYAL CORNWALL INFIRMARY.—House Surgeon, unmarried. Salary £100, increasing by £10 a year, with board (excluding stimulants) and apartments.

ROYAL INFIRMARY, Sheffield.—Senior Assistant House Surgeon. Salary £80 per annum, with board, lodging, and washing. Also Junior Assistant House Surgeon. Salary £70 per annum, with board, lodging, and washing.

ROYAL LANCASTER INFIRMARY.—Assistant House Surgeon, single. Salary £60 a year, with residence, board, attendance, and washing.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—Junior House Surgeon for six months. Salary at rate of £50 per annum, with rooms, board, and washing. Also Dispenser. Salary £60 per annum, with board, rooms, and washing.

RUBERY HILL ASYLUM, Burnt Green, Worcestershire.—Junior Assistant Medical Officer. Salary £130 per annum, with board, furnished apartments, &c.

SALOP INFIRMARY, Shrewsbury.—House Surgeon. Salary £100 per annum, with board, washing, and residence.

SOMERSET AND BATH LUNATIC ASYLUM, Wells, Somerset.—Medical Superintendent. Salary £600 per annum, with furnished house and allowances.

TAUNTON AND SOMERSET HOSPITAL, Taunton.—Assistant House Surgeon. Salary at the rate of £60 per annum, with board, lodging, and laundry.

TOTTENHAM HOSPITAL.—Senior Resident Medical Officer. Salary £90 per annum, with board, residence, and laundry.

VICTORIA HOSPITAL, Folkestone.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

WANDSWORTH AND CLAPHAM UNION INFIRMARY, St. John's-hill, S.W.—Junior Assistant Medical Officer. Board, lodging, and washing provided. Salary £70 per annum, payable quarterly.

WEST AFRICA.—Three Medical Officers. Salaries offered £40 per month, plus subsistence allowance, first class passages, and outfit allowance.

WEST HERTS INFIRMARY, Hemel Hampstead.—House Surgeon, single. Salary £100 per annum, with furnished rooms, board, fire, lights, washing, and attendance.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—House Surgeon. Salary £120 per year, and £30 per year for Dispensing, with furnished apartments and attendance.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—Assistant House Surgeon. Honorarium at the rate of £75 per annum will be given. Board, lodging, and washing provided. Also Assistant House Physician. Honorarium at the rate of £75 per annum will be given. Board, lodging, and washing provided.

WOLVERHAMPTON EYE INFIRMARY.—House Surgeon. Terms, £70 per annum, rooms, board, and washing.

Births, Marriages, and Deaths.

BIRTHS.

BEATTY.—On July 22th, at Melrose, Clacton-on-Sea, the wife of T. Carlyle Beatty, M.D., of a daughter.

CALEY.—On July 29th, at Colville House, Ealing, the wife of Guthrie Neville Caley, M.D., of a son.

EDWARDS.—On July 28th, at Peckham-road, the wife of Francis H. Edwards, M.D., M.R.C.P., of a son.

GILBERTSON.—On July 23th, at Hitchin, the wife of James Henry Gilbertson, M.R.C.S., L.R.C.P. Lond., of a son.

LANGFORD.—On July 25th, at Weston-park, Crouch-end, N., the wife of C. Harris Langford, M.B. Lond., of a daughter.

MANSELL-WOODHOUSE.—On July 21st, at Beaumont-street, W., the wife of Walter Mansell-Woodhouse, M.R.C.S. Eng., L.R.C.P. Lond., Wantage, Berks, of a son.

WILLIAMS-FREEMAN.—On July 23rd, at Weyhill, Andover, the wife of John P. Williams-Freeman, M.D., of a daughter.

MARRIAGES.

EVANS—BEENHAM.—On July 23rd, at St. John the Divine's, Richmond, by the Rev. A. W. Goodwin, David Robert Powell Evans, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A., to Jessie, daughter of Charles Beenham.

HILL—FREND.—On July 24th, at St. Pancras Church, by the Rev. R. J. Golding-Bird, D.D., Joseph Shuter Hill, L.R.C.P., M.R.C.S., to Rebecca Billingsley, widow of A. B. Frend and only child of the late John Indermaur.

HORSFALL—CAMPBELL.—On July 24th, at Holy Trinity, Melrose, by the Rev. W. Horsfall, Charles Edward Horsfall, M.B., Bedale, Yorkshire, to Lilias Marianne, daughter of Robert Hume Campbell, of Glendaruel, Argyllshire.

LAWTON—GILMOUR.—On July 25th, at St. Michael's Church, Birkenhead, by the Rev. A. Hamilton King, William Lawton, M.B., to Florence Purdon, only child of the late James Gilmour, F.C.S.

STABB—FROUDE.—On the 30th July, at Marylebone parish church, by the Rev. Cecil Wood, Ewen Carthew Stabb, F.R.C.S., of 57, Queen Anne-street, W., eldest son of William Henry Stabb, of Ilfracombe, to Emma Langworthy, daughter of the late James Henry Froude, of Newent, Glos.

DEATHS.

BLACK.—On July 23rd, at Tête du Lion, Valtournanche, Italy (the result of an accident), Robert Black, M.D., of Pavilion-parade, Brighton.

HORSFALL.—On July 23rd, at Newland House, Leamington, Francis Horsfall, M.R.C.S. Eng., L.R.C.P. Edin., aged 80 years.

SCOWCROFT.—On July 10th, 1901, John Edwin Scowcroft, M.D., Mayor of Bolton, Surgeon-Captain 2nd V.B. L.N.L. Regiment, at his residence, Oakleigh, Great Lever, Bolton, aged 56 years.

WILLIAMS.—On July 26th, at Ramsgate, John Worthy Williams L.R.C.P. Lond., aged 44 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE UNQUALIFIED PRACTITIONER AGAIN.

MR. P. P. MAITLAND, the coroner for the West Riding District of Yorkshire, held an inquest at the Clothiers' Arms Hotel, Batley Carr, recently, on the body of the infant son of Theophilus Whitehead, miner, of Common Side, Hanging Heaton, Batley. Evidence was given by several witnesses.—Coroner (to the father): Was it your idea that Howarth should attend?—Well, we went for the nearest.—Did you know that he was not a properly qualified man?—No, he said that if the child died he could give a certificate.—Why did you ask him if he could give a certificate?—Because he had had some bother before about giving one.—As there had been a difficulty before why did you go to him?—Well, he said he had got over it and could give a certificate now. He said he had also some letters from the Registrar-General on the subject.—The coroner pointed out to witness that the certificate given by Howarth in one place said death was due to asphyxia and in another to premature birth.—Witness: Well, they told me he was a qualified man.—Coroner: I only wish to point out again that asphyxia means death from suffocation and that is totally wrong. It is a pity that he is employed by unintelligent people. Such men as Howarth who are unqualified and uneducated should not, in his (the coroner's) idea, be allowed to practise. He had had a similar trouble with the same man before.—Mr. Charles D. Garrett of West Town, Dewsbury, had made a post-mortem examination of the body and from that said he found that the cause of death was heart failure due to premature birth and that the certificate given by Howarth was totally wrong.—Mrs. Burnley, a neighbour, said that she took the certificate to the registrar (Mr. S. Harrison), but he declined to accept it on the grounds that Howarth was not a qualified practitioner, and he therefore reported the matter to Mr. Maitland. It also appeared from the evidence that a few weeks before the deceased's mother fell upon her face and chest. In the end the jury agreed to a verdict of "Heart failure due to premature birth, probably caused by a fall." Mr. Maitland informed the jury that he would again report the matter to the Registrar-General in London, and he also thought that something ought to be done by the "Medical Association."

"A SAFETY WINDOW-CLEANING APPARATUS."

To the Editors of THE LANCET.

SIRS,—In reference to the article on this subject which appeared in THE LANCET of July 27th, p. 214, I think it cannot be generally known that a reversible window sash has been in the market some little time. It is made by Mr. Linskill, builder, Harrogate. I had one introduced into my house last year and it is perfectly satisfactory. The glass can be cleaned thoroughly from the inside and quite easily. I have asked Mr. Linskill to forward you the descriptive papers on the subject.

I am, Sirs yours faithfully,

Kidderminster, July 28th, 1901. S. STRETTON, M.R.C.S. Eng.

SEA AIR AND ECZEMA.

To the Editors of THE LANCET.

SIRS,—I should be much obliged if some of your correspondents would give me their opinion as to whether sea air is really so hurtful to eczema and some skin affections as most authorities imagine. I have a patient who is about to retire from business and thinks of taking up his residence at Bournemouth; he suffers slightly from eczema.

I am, Sirs, yours faithfully,

July 29th, 1901. P. P.

LOCUM-TENENTS.

To the Editors of THE LANCET.

SIRS,—Referring to the letter by "M.D. BRUX." in THE LANCET of July 27th, p. 258, in which he gives an undoubtedly useful hint to medical men, may I be allowed to do the same by giving several? I would, as a principal and locum-tenent myself, urge on practitioners that it is impossible to obtain good men at low fees. A locum-tenent should be treated as such, not as a temporary assistant. Consequently, principals should see that their agents procure for them only men of some years' experience, for I maintain that a newly qualified man is in no way fitted to act as a "locum-tenent" or one "holding place." A locum-tenent should not only have self-confidence, but should be a man of experience in general practice, and such a man is not willing, nor is it fair to expect it, to take charge of a practice at an assistant's wage. I would say to principals, Do not boast of the good qualities of former locum-tenents and do not talk of the failures of the rest. Do not expect a practice to increase whilst under a locum-tenent's charge and unless negligence can be proved do not blame him. Pay a fair price for a good article and see that it is supplied. As for a locum-tenent, under present conditions, not attending to agents' wires, what about the principal who is taken suddenly ill? Has he to wait to advertise or answer advertisements? In the same issue of THE LANCET (p. 229) is a good letter by "G. P." (headed "The Times are Troublous"), in which he says he believes that although locum-tenents and assistants are scarce

the profession was never more overcrowded. My experience of 17 years confirms his statement. But there is a remedy, partial, it is true, but still a help. Never was the locum-tenent more of a necessary and less of a luxury. Why, then, should not men of, say three years' experience and upwards, form a coöperative Locum-Tenents and Assistancy Association? We should then get good, experienced men and the locum-tenent would feel that he was a recognised member, not a parasite, of the profession. A house could be hired in London, so that in the intervals between engagements locum-tenents could be lodged, &c., at a fair price and always ready to go anywhere. In fact, the nursing homes could be taken as a model. Further, I will say that if this were done there are many able men who would rather live as I suggest than starve in their so-called practices, and who have started their so-called practices rather than put up with the petty tyrannies of some—and I am glad to be able to say it, a few—principals. I trust this letter may bear the fruit I desire for it, and I also trust that principals as well as locum-tenents will support the idea.

I am, Sirs, yours faithfully,

July 27th, 1901. L. T.

THE LATE MR. R. B. ANDERSON, F.R.C.S. ENG.

THE committee formed to appeal for aid on behalf of the widow and two sons of Mr. Anderson (see THE LANCET of July 13th, p. 103) beg gratefully to announce the following list of subscriptions to July 25th, amounting in all to £52 10s.

	£	s.	d.
The Earl of Stamford (chairman)	10	0	0
Mr. Timothy Holmes (honorary treasurer)	5	0	0
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Dr. Milner Browne ...	0	10	6
Mr. Walter Monnington (honorary secretary)...	1	1	0
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Dr. Herbert Owen ...	1	1	0
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Dr. C. Crawford...	1	1	0
Mr. J. H. Waddington ...	0	10	6
Mr. W. Smith	0	10	6
Mr. C. Coates	2	2	0
Dr. G. F. Blandford... ...	3	3	0

Mr. Walter Monnington, 7, Fig Tree-court, Temple, E.C., is honorary secretary. Donations for "The late R. B. Anderson Fund" should be sent and made payable to the Manager, Union Bank of London, Chancery-lane, London.

J. P. S.—We do not know the man, but the style of the letter would seem to show that he is one of the touting money-lenders against whom recent legislation was directed. The annoyance to which our correspondent is being subjected is due to his name having got upon the list of one of these persons. They act in combination and exchange lists.

P. V. T. (Longton) is thanked for his letter. There is much to be said for his argument, but the way in which he discusses the matter will not tend to bring about the reform he desires.

Colne.—We cannot answer definitely as sufficient information is not before us. Will our correspondent send us full details of the office which he has filled.

J. C.—There is, we regret to say, no institution of the kind.

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (5th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M.).

TUESDAY (6th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Royal Ear (3 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

WEDNESDAY (7th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.).

THURSDAY (8th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), St. Mark's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

FRIDAY (9th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

SATURDAY (10th).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), London Throat (2 P.M.), Throat, Golden-square (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1901, which was completed with the issue of June 29th, and the Title-page to the Volume, were given in THE LANCET of July 6th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1901 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

Cases for binding the half-year's numbers are now ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 3*d.*

To be obtained on application to the Manager, accompanied by remittance.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, August 1st, 1901.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
July 26	29·60	N.	1·60	74	63	57	59	62	Overcast
,, 27	29·69	SSW	1·20	94	64	57	58	59	Raining
,, 28	29·79	S.	0·40	114	73	56	60	66	Cloudy
,, 29	29·99	E.	0·20	118	80	56	60	66	Hazy
,, 30	30·19	S.W.	...	109	81	61	66	70	Fine
,, 31	30·22	N.	...	119	81	63	64	70	Hazy
Aug. 1	30·09	N.	...	116	73	61	62	65	Cloudy

During the week marked copies of the following newspapers have been received:—*Leeds Mercury, South Wales Daily Telegraph, Hertfordshire Mercury, Liverpool Daily Post, Norfolk Chronicle and Norwich Gazette, Yorkshire Post, Norfolk News, Reading Mercury, Weekly Free Press (Aberdeen), Referee, Bristol Mercury, La Domenica del Corriere, Halifax Guardian, Atherstone News, &c., &c.*

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